ENGINEERING NEWS-RECORD

MAY 30, 1957

CONTENTS ON PAGE 17

- Full treatment for refinery's wastes p. 39
- Mud—40 feet deep—makes bridge costly p. 46

Tom Veatch: Growth and a new office building p. 32

A McGRAW-HILL PUBLICATION

MICH STATE LIBRARY
LANSING MICH 13

Workmen ready 60" O.D. wrought iron intake lines for rugged cross-country service

Corrosion resistant Wrought Iron water lines need no protective coatings and wrappings

Wrought iron's unique built-in protection against corrosion eliminates the need for costly coatings and wrappings on underground water lines.

This built-in protection stems from a defensive network of over 250,000 glasslike iron silicate fibers present in each cross-sectional square inch of wrought iron. When corrosion attacks, these fibers quickly arrest any pitting or rapid penetration.

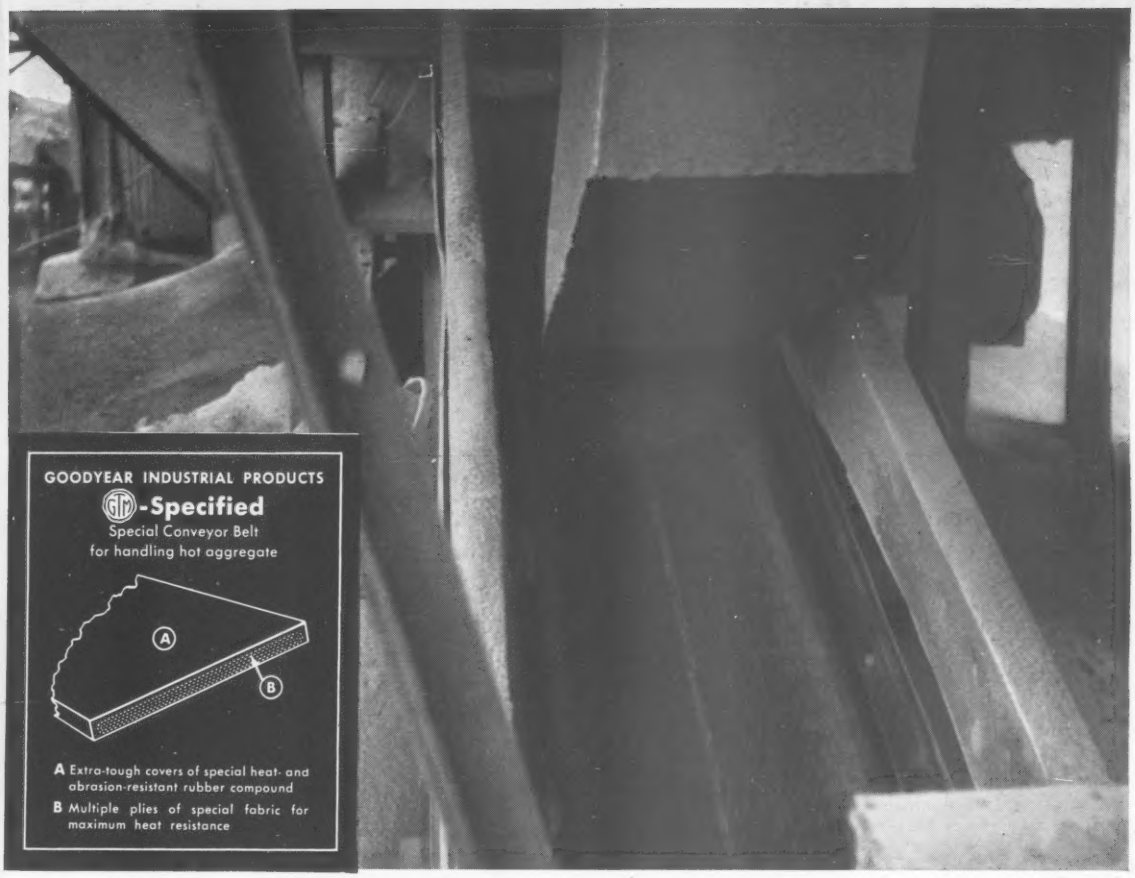
Wrought iron's relative immunity to corrosive soils and waters has been proved in actual service. Our booklet, *Wrought Iron for Underground Services,* gives case history support for the low annual cost of this material. Write for a copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Division Offices in Boston, New York, Philadelphia, Washington, Atlanta, Pittsburgh, Chicago, St. Louis, Houston, San Francisco. International Division: New York, N. Y.

Available in Canada and throughout the world

BYERS *Wrought Iron Tubular and Hot Rolled Products*

ALSO ELECTRIC FURNACE QUALITY STEEL PRODUCTS


GOODYEAR INDUSTRIAL PRODUCTS
G.T.M.-Specified
Special Conveyor Belt
for handling hot aggregate
A
B
A Extra-tough covers of special heat- and abrasion-resistant rubber compound
B Multiple plies of special fabric for maximum heat resistance

Saved over $4,000 on hot-and-heavy job

A heavy flow of aggregate for asphalt mix—delivered at a smoking 450° F.—quickly beat and burned the life out of all previous belts used at this upper New York State batch plant. The longest service was a scant 3 months. And their former belt supplier advised that this was tops under the rugged conditions.

But that was before the G.T.M.—Goodyear Technical Man—made his recommendation: a special belt muscled with multiple plies of special fabric and armored with heat- and abrasion-resistant covers. *Installed, the G.T.M.'s belt put in 37 months of service—saved over $4,000 in belt replacement and maintenance costs alone.*

Eye-opening savings like this are always possible when the G.T.M. tackles a job. He's your man no matter what your industrial rubber problem. Contact him through your Goodyear Distributor—or by writing Goodyear, Industrial Products Division, Akron 16, Ohio.

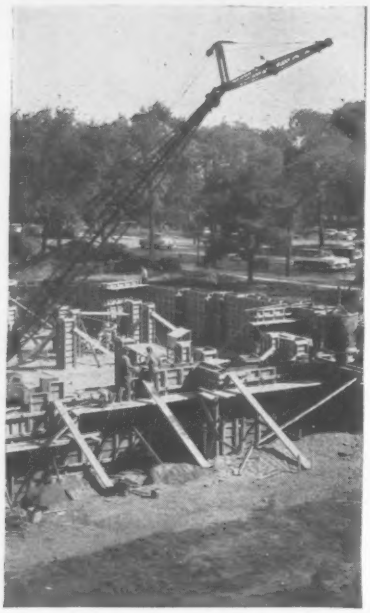
CONVEYOR BELTS by

GOODYEAR

THE GREATEST NAME IN RUBBER

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

Symons FIELD REPORT...



Contractor Pours 200 Yds. Concrete in One Day with SYMONS FORMS

17,500 square feet of Symons Forms with steel cross members were used to form curved walls, large pilasters and stepped footings on the new addition to St. Scholastica School in Chicago. Walls varied in thickness from 18 to 20 inches and in height from 9 to 10 feet. During one shift, from 8:00 a.m. to 4:30 p.m., the contractor was able to pour 200 yards of concrete. Overall size of the project is 190 x 190 and estimated cost is in excess of $1,000,000.

Symons engineers and sales representatives can show you how Symons Forms solve many specific forming problems. For example, from your plans our engineers will prepare a complete form layout and cost sheets—no charge or obligation. Also, Symons salesmen are competent to advise your work crews on most efficient, cost-saving methods of form erection and stripping.

Forms may be rented with purchase option. Symons Clamp & Mfg. Co., 4265 Diversey Avenue, Dept. C-7, Chicago 39, Illinois.

Fred Berglund & Son, Inc., Chicago, Illinois, general contractor for St. Scholastica School job.

Catalogs and Added Information on FORMS—CLAMPS—SHORES Sent on Request

ENGINEERING NEWS-RECORD

EIGHTY-THIRD YEAR OF PUBLICATION

MEMBER

Editorial Offices, 330 W. 42nd St., New York 36, N. Y.
New York - LOngacre 4-3000; Chicago - MOhawk 4-5800; San Francisco - DOuglas 2-4600; Washington - REpublic 7-6630

Waldo G. Bowman, Editor

Highways, Airports—Transportation

Eugene E. Halmos, Jr., *Senior Editor*
Edward M. Young, Jr., Joseph N. Todaro

Buildings, Bridges—Structures

Frederick S. Merritt, *Senior Editor*
James B. Sullivan, John P. Mahoney

Rivers, Sanitation—Water Use

Arthur J. Fox, Jr., *Senior Editor*
Howard Jacoby, Marc Leggiero

Finance, Labor—Management

Clyde C. Henning, *Associate Editor*
Charles J. Harding

Regional Editors

J. Roland Carr, *Chicago, 520 N. Michigan Ave.*
Lauress L. Wise, *San Francisco, 68 Post St.*

Copy, Presentation—Production

Stanley C. Jensen
Barbara Lamb
Harry W. Jensen, *Presentation*
Philip J. Horn, Jr.
John C. Greenough, *Printing*

Statistics, Prices, Costs—Business News

Elsie Eaves, *Manager*
Julia Mahoney, *Construction Reports*
Mildred Wetzel, Marion Sciorra
Diane Tartaglia, Mary Nolan
James Webber, *Economics*
Ruth Carlson, Marie Roessler
Evelyn Huber, Jean Namias

Editorial Research and Indexing

Helen Rich
Eva Gierat, Rene Hay, Patricia Witschger
Marianne Stern, Ruth Solomon, Marie Bellon

Consulting Editors: **Van Tuyl Boughton,** *New York*
Nathan A. Bowers, *San Francisco*

Washington Bureau, National Press Bldg., Washington 4, D. C., George B. Bryant, Jr., Chief, Alan E. Adams, Glen R. Bayless, Roy Calvin, Ernest Conine, John C. L. Donaldson, Jay Flocken, Boyd France, Sam J. Justice, Arthur J. Kraft, Donald O. Loomis, Gladys Montgomery, Arthur L. Moore, Seth T. Payne, Morton A. Reichek, V. Craig Richter, Caroline W. Robertson, Vincent B. Smith.

Domestic News Bureau: Cleveland—1510 Hanna Bldg., Cleveland 15, William G. Meldrum, Michelle M. Perry; **Detroit**—856 Penobscot Bldg., Detroit 26, Harry Homewood, Chief, Nancy Moore; **Pacific Coast**—68 Post Street, San Francisco 4—Margaret Ralston, Chief, Jenness Keene, Sue Johnson, 1125 West 6th Ave., Los Angeles 17—John K. Shinn, Michael J. Murphy; **Seattle**—6040 Fifth Ave., N. E., Ray Bloomberg; **Southeastern**—801 Rhodes-Haverty Bldg., Atlanta 3, Charles T. Dixon, Jr., Chief, Frances Ridgway; **Southwestern**—901 Vaughn Bldg., Dallas, Kemp Anderson, Jr., Chief, Lorraine Smith.

Foreign News Bureaus: New York—John Wilhelm, Editor; **London**—William J. Coughlin; **Paris**—Robert E. Farrell; **Rio de Janeiro**—Peter Weaver; **Mexico City**—Jack Kearney; **Bonn**—Morrie Helitzer; **Beirut**—O. M. Marashian; **Tokyo**—Dan Kurzman; **Melbourne**—Alicja Grobtuch. Correspondents in 56 cities throughout the world.

Correspondents: In 77 principal cities in the U.S. and possessions and the Dominion of Canada.

McGraw-Hill Economics Department: Dexter M. Keezer, Director; W. H. Chartener

Robert F. Boger, Publisher

ENGINEERING NEWS-RECORD, Vol. 158, No. 22, MAY 30, 1957

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Publication Office, 99-129 North Broadway, Albany 1, N. Y. See panel below for directions regarding subscriptions or change of address. **Executive, Editorial, Advertising and Circulation Offices. McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** Donald C. McGraw, President; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice President, Publications Division; Ralph B. Smith, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. **Subscriptions are solicited only from persons with identifiable commercial or professional interest in construction and building. Position and company connection must be indicated on subscription orders.** United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20.00 per year, payable in advance. Second-Class mail privileges authorized at Albany, New York. Printed in U.S.A. Title registered in U.S. Patent Office.

© Copyrighted 1957 McGraw-Hill Publishing Company, Inc. All Rights Reserved.

SUBSCRIPTIONS: Send subscription correspondence and change of address to Subscription Manager, ENGINEERING NEWS-RECORD, 330 W. 42nd St., New York 36, N. Y. Subscribers should notify publisher promptly of any change of address, giving old as well as new address, and including postal zone number, if any. If possible, enclose an address label from a recent issue of the magazine. Please allow one month for change to become effective.

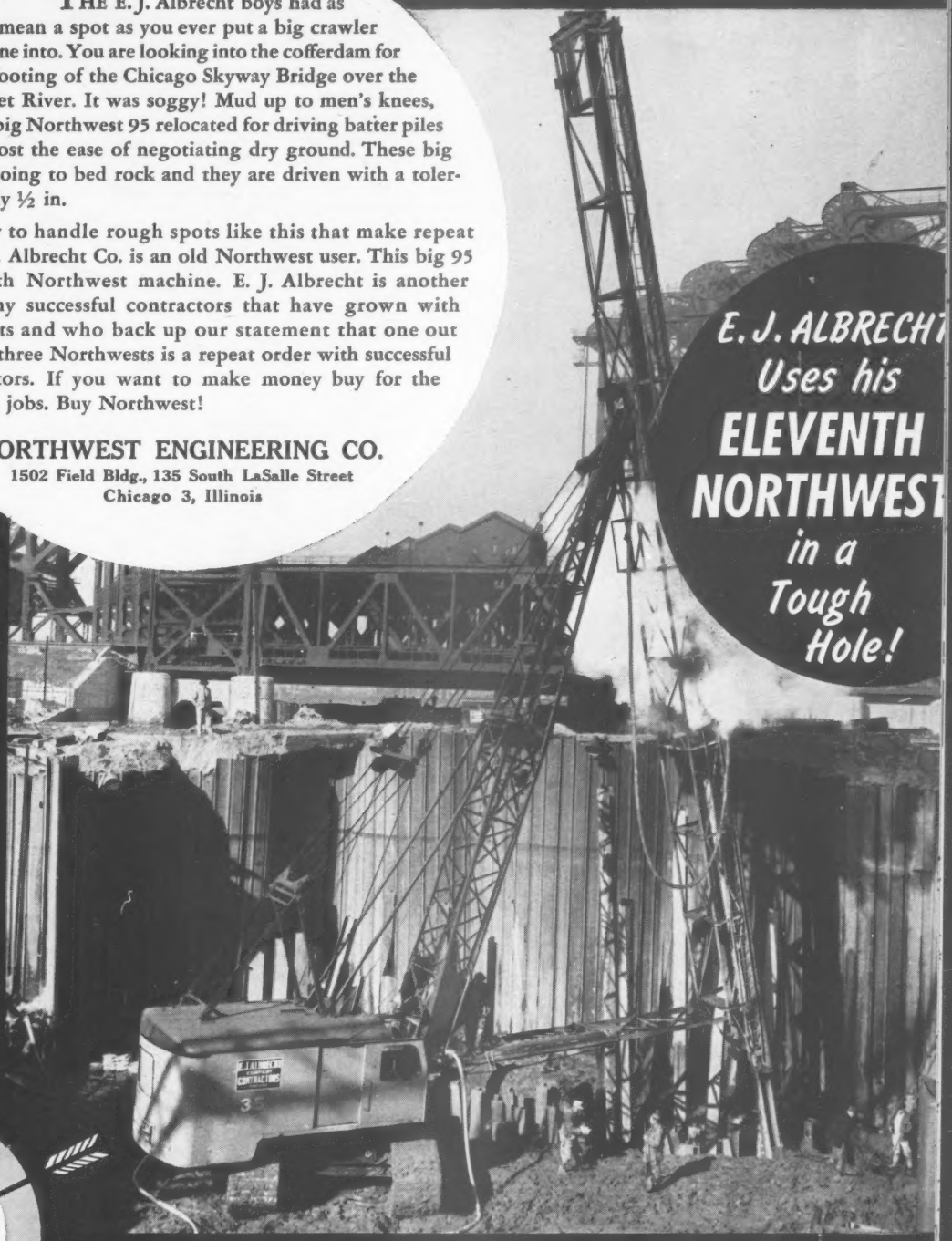
Postmaster: Please send Form 3579 to Engineering News-Record, 330W. 42nd St., New York 36, N. Y.

CHICAGO SKYWAY!

THE E. J. Albrecht boys had as mean a spot as you ever put a big crawler crane into. You are looking into the cofferdam for the footing of the Chicago Skyway Bridge over the Calumet River. It was soggy! Mud up to men's knees, but the big Northwest 95 relocated for driving batter piles with almost the ease of negotiating dry ground. These big piles are going to bed rock and they are driven with a tolerance of only ½ in.

It is ability to handle rough spots like this that make repeat orders. E. J. Albrecht Co. is an old Northwest user. This big 95 is their 11th Northwest machine. E. J. Albrecht is another of the many successful contractors that have grown with Northwests and who back up our statement that one out of every three Northwests is a repeat order with successful contractors. If you want to make money buy for the tough jobs. Buy Northwest!

NORTHWEST ENGINEERING CO.
1502 Field Bldg., 135 South LaSalle Street
Chicago 3, Illinois

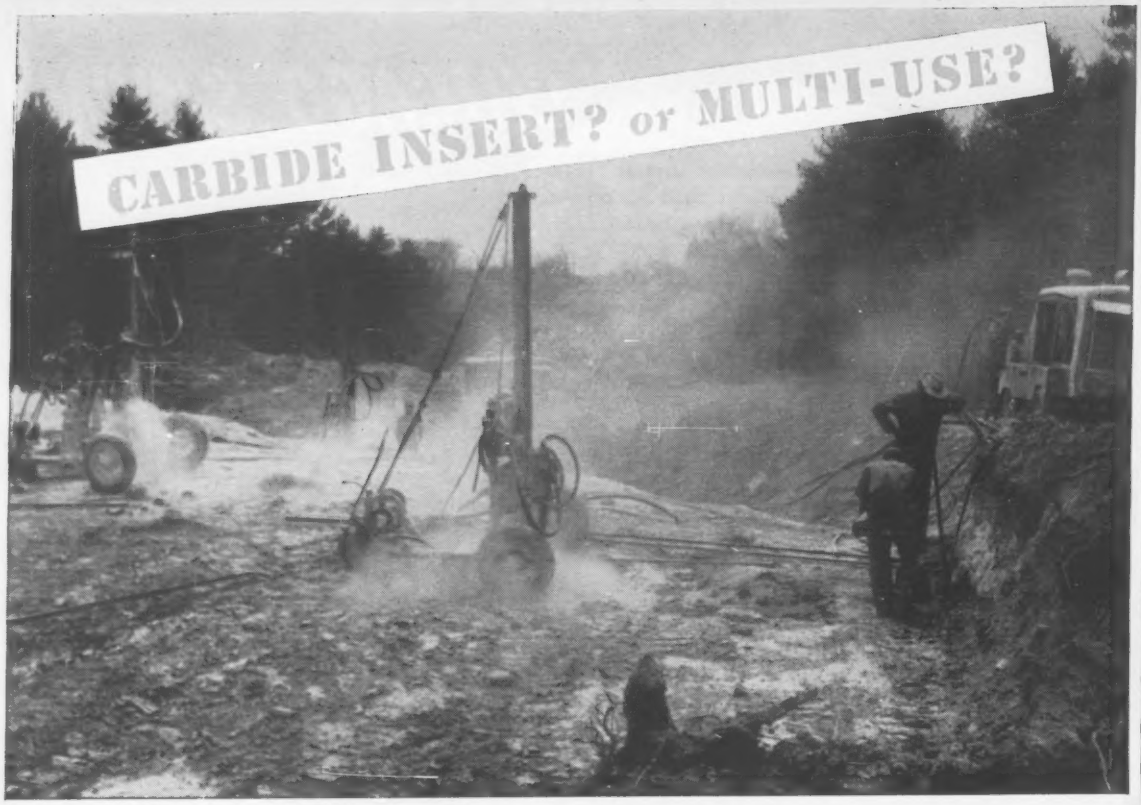


E. J. ALBRECHT Uses his ELEVENTH NORTHWEST in a Tough Hole!

THE GREATEST COMBINATION OF PROVED ADVANTAGES EVER BUILT INTO A SHOVEL, CRANE, DRAGLINE OR PULLSHOVEL

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS



"We get maximum production at lowest bit cost with TIMKEN® carbide insert bits"

... Reports The Bridge Construction Corporation

IMPROVING U. S. Highway 1 near Woolwich, Maine, required the removal of 152,000 cubic yards of granite. In drilling blast holes to depths of 20 feet, the Bridge Construction Corporation, of Augusta, got maximum production at lowest bit cost per foot-of-hole with Timken® *carbide insert* bits.

Timken carbide insert bits permitted increased drilling speed and fewer bit changes. They made it possible to drill out full increments of drill steel.

They're your best bet, too, for drilling in tough, abrasive ground. But carbide insert bits may not be best for every job.

When drilling in ordinary ground you'll find more economy when you use Timken *multi-use* bits. With correct and controlled reconditioning, they give you the lowest cost per foot-of-hole when you can drill out full increments of drill steel.

Timken carbide insert and multi-use bits save time because they're interchangeable in the same thread series. They permit you to switch bits when the ground changes without changing drill steels. Both types of Timken bits have a special shoulder union that protects threads from drilling impact.

And Timken carbide and multi-use bits are made from Timken fine alloy steel. We're the only American removable bit manufacturer that makes its own steel. It enables us to control quality every step of the way.

For the right bit for your particular job, call or write the Timken Rock Bit Engineering Service, The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken Threaded multi-use rock bit

Timken threaded carbide insert rock bit

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

your best bet for the best bit for every job

This AMVIT* SEWER LINE is a life line carrying industrial wastes to safe disposal

Carborundum Metals Company
Washington, West Virginia

Engineers and Builders
The H. K. Ferguson Company

This is the last time you'll see that length of pipe going into the ditch. Yet it will serve a new industrial plant for many years.

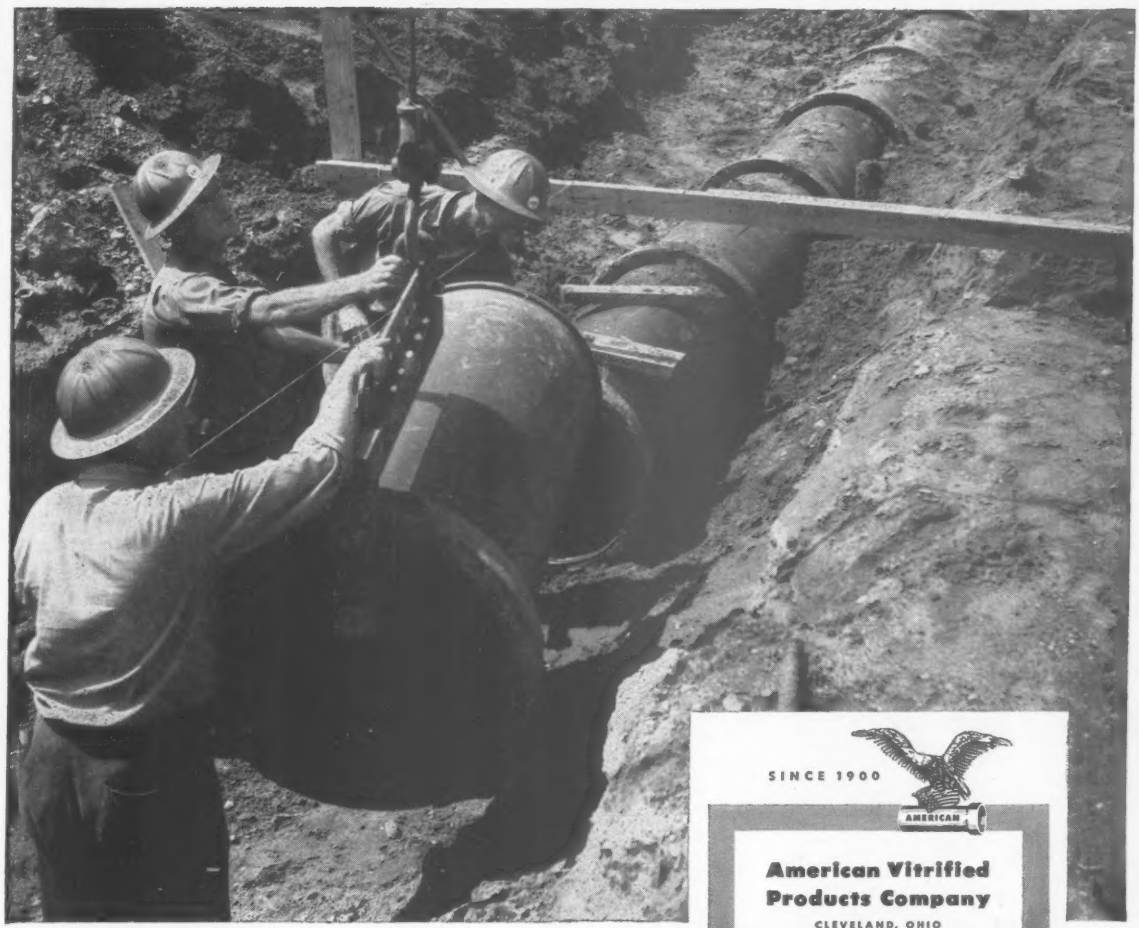
That sewer line will carry thousands of gallons of diluted acids, oils, alkali solutions and other waste material from Carborundum Metals new plant to a nearby treatment plant. Here the already diluted waste materials are made completely neutral and harmless to plant, animal and fish life. This line is one of the important life lines of that factory.

The Amvit joint was specified for this job because like the clay pipe it is unharmed by underground service.

A true mechanical joint, Amvit is made from plasticized resins of polyvinyl chloride. Thousands of feet of Amvit Jointed Clay Pipe have been installed on industrial waste disposal lines such as this.

Amvit Jointed Clay Pipe, in sizes 4" through 24", together with all fittings is available for immediate delivery in Northeast and Central States.

For more information, write or call American Vitrified Products Company, National City Bank Building, Cleveland, Ohio, or our office nearest you.



*T. M. Registered. Patents Pending.

The Amvit Joint is made of a plastic material with rubber-like characteristics. Like the pipe, the joint will withstand the most severe underground conditions. Amvit Joint is furnished on all fittings.

SINCE 1900

AMERICAN

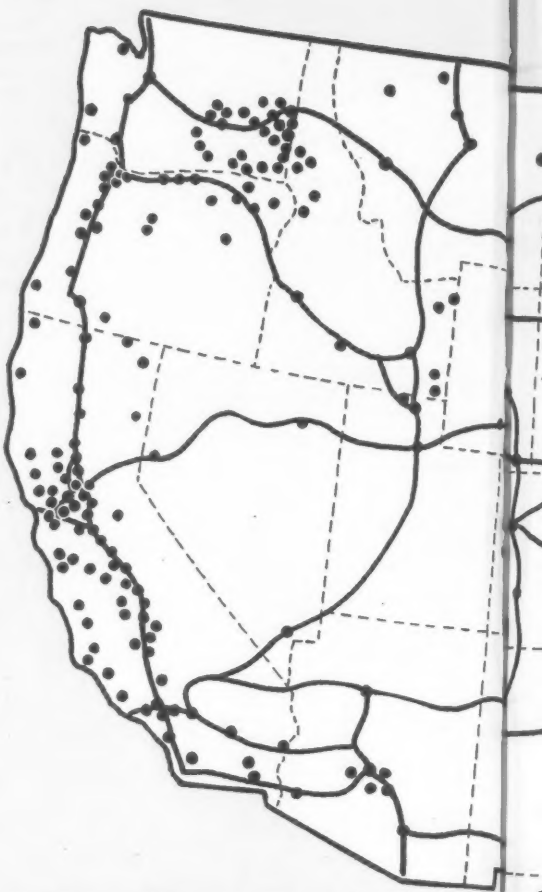
American Vitrified Products Company

CLEVELAND, OHIO

MANUFACTURERS of: Clay pipe, flue liners, clay liner plates and concrete pipe.

Plants Across the Nation...Brazil, Indiana • Chicago, Illinois • Cleveland, Ohio • Crawfordsville, Indiana • Detroit, Michigan • East Liverpool, Ohio Fenton, Michigan • Grand Ledge, Michigan • Lisbon, Ohio • Los Angeles, California • Milwaukee, Wisconsin • South Bend, Indiana • Uhrichsville, Ohio

ONE GOAL
To concentrate the capabilities, resources and experience of our people and of the world-wide Caterpillar dealer organization on the design, manufacture, distribution and service of job tested heavy equipment....
CATERPILLAR TRACTOR CO.



Caterpillar Dealer sales and service along the Interstate Highway System

Write today for free booklet, "The Road Ahead," with full details of the Federal-Aid Highway program.

Caterpillar Tractor Co., Dept. ENR-5, Peoria, Illinois

Please send me_____copies of "The Road Ahead."

*Name*_____

*Address*_____

*City*_____ *State*_____

CATERPILLAR-ONE GOAL

ONE GOAL . . . To concentrate the capabilities, resources and experience of our people and of the world-wide Caterpillar Dealer organization on the design, manufacture, distribution and service of job-tested heavy equipment. . . .

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

KANSAS TURNPIKE Self widener purchased for use on Kansas City, Missouri, Freeway interchanges—built in flexibility made use on Kansas Turnpike equally profitable.

Again Flex-Plane has the nation's number one finisher

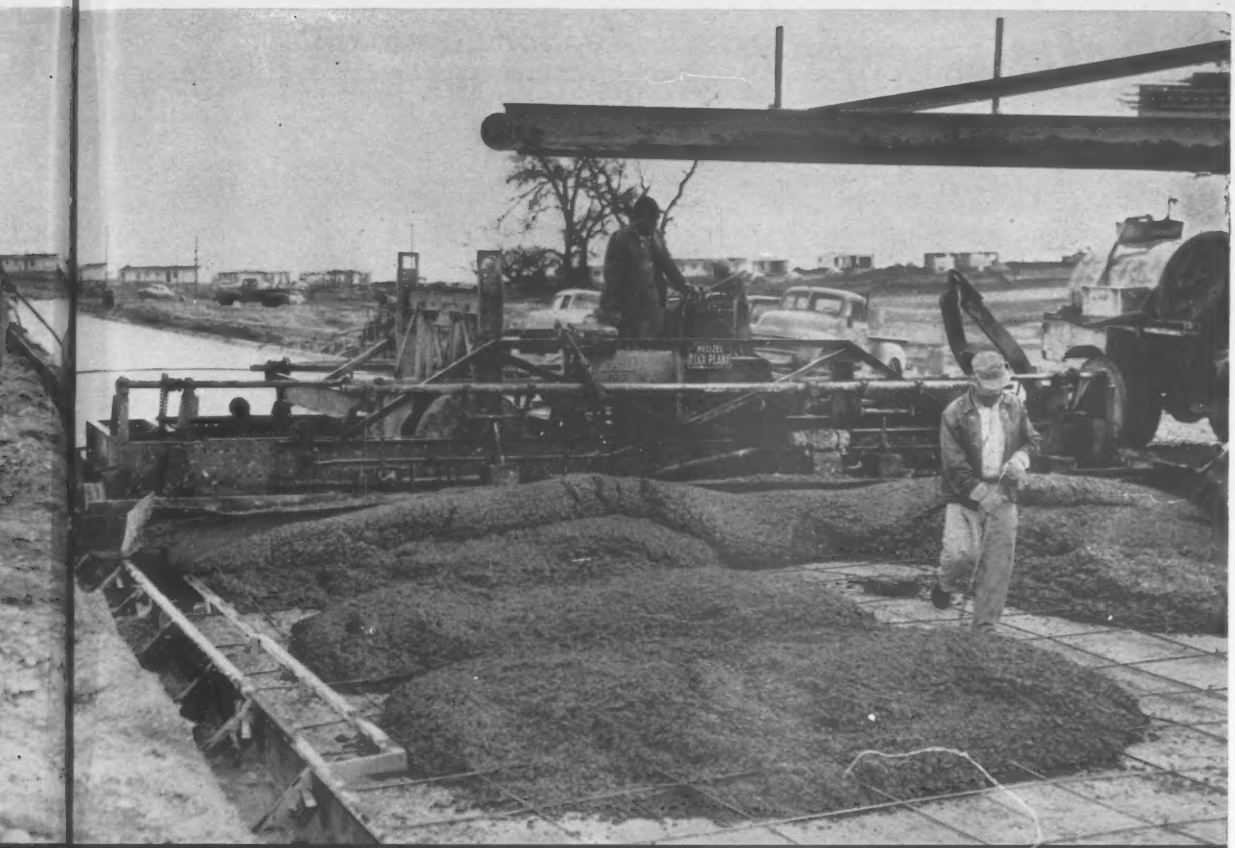
For the past three years, contractors have bought more Flex-Planes than all other makes — They will again in 1957...here's why

From the moment the FLEX-PLANE finisher was introduced it has been the favorite of the nation's highway builders. For the past three years it has been in a class by itself—the most versatile, most flexible, most portable and least expensive to operate of any machine on forms.

Now, for 1957, the FLEX-PLANE finisher is even

INDIANA TURNPIKE More miles of Indiana Turnpike were finished with Flex-Plane machines than any other.

NEW JERSEY TURNPIKE Holland Tunnel cutoff had many ramps and sections. Self-widening feature paid divi



TEXAS CITY STREETS Contractor reported highest pouring ever. Credits Flex-Plane. Note amount of concrete in front of screed here.

better! It is more flexible, stronger and faster than ever! Inherent frame design features allow the greatest amount of flexibility—*even as much as 12 to 25 feet in one machine!* And, there is a complete line of FLEX-PLANES to cover any width range desired. Only FLEX-PLANE self-widening offers independent control of extension frames, which means both sides of the machine can be extended or retracted together—*or individually*, for the negotiation of complicated interchange patterns involving variable width and short radius super elevated curves. But, more important, it is the only really proved self-widening machine available today. More than 60 units operating throughout the nation attest to this.

The FLEX-PLANE carries the largest screeds in the industry-delivering the most satisfactory finish possible. Exclusive butt joint screed design enables screed lengths to be changed faster, easier than ever before. It is completely portable—a flick of the finger and it, instantaneously, becomes its own trailer.

Why not let FLEX-PLANE put you in contact with a FLEX-PLANE user? Talk to him and we are sure you, too, will GO FLEX-PLANE IN 1957!

RDEN STATE PARKWAY Contractor watched machine operate on nearby Route 1 project. Bought immediately.

THE FLEXIBLE ROAD JOINT MACHINE COMPANY
501 THOMAS ROAD · WARREN, OHIO

To Best Meet Fencing Needs

PAGE FENCE

offers the Widest Choice

You can choose from

—8 Fence Styles
—8 Fence Heights
—4 Fabric Metals
—2 Types Metal Posts
—Top Rail or Top Wire
—Single or Double Extension Arms
—6 Gate Styles, Many Widths

• PAGE provides a wider choice of long lasting fence fabric metals. Each has characteristics which meet individual preferences or make it more suitable to meet certain climatic or service conditions.

Galvanized Steel • Woven of time-proved open-hearth steel wire, hot-dipped galvanized after weaving to assure long service.

Aluminized Steel • By a PAGE patented process a coating of commercially pure aluminum is bonded to steel wire to provide longer corrosion resistance, yet its cost is comparable with fence fabric having shorter life expectancy.

Aluminum • Another metal in non-corrosive class. It will not rust, will not discolor materially under unfavorable conditions. Semi-flat weaving gives it exceptional strength.

Stainless Steel • This chrome-nickel fabric is immune to practically all corrosive elements. Advantageous near salt water and where air is laden with smoke, sulphur and other factory emissions.

Nation-wide Erecting Service • In more than 100 districts there are local, responsible members of Page Fence Association—the largest fence engineering, erecting and servicing organization. These experts own their own plants and equipment, carry complete stocks of PAGE FENCE materials, and operate crews of trained workmen. Each firm is permanently located and has lasting interest in every job it handles.

Write for file-size folder containing full information and name of member nearest you. Address—

PAGE FENCE ASSOCIATION
Dept. E • MONESSEN, PA.

A PRODUCT OF PAGE STEEL & WIRE DIVISION AMERICAN CHAIN & CABLE COMPANY, INC.

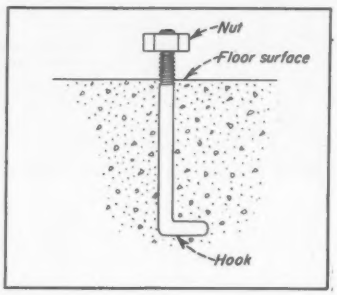
Reader Comment

Anchor Bolts Are Problem

SIR—The engineering profession should be continuously probing and investigating existing design and construction practices to establish safer and more economical design and construction. But is it so?

Recently, I saw a big group of men placing concrete and setting up thousands and thousands of anchor bolts for a giant industrial plant near Indianapolis. The bolts projected 3 to 6 in. above the concrete floor. Material-handling men complained bitterly about the obstructions and interferences of these bolt projections and the erection crew cursed loudly about anchor bolts that were off line. The crew had to bend them by hammering or even burning them with torches to fit them into the bolt holes.

Present-day anchor bolts are rather primitive and crude in design. They are merely made of steel rods hooked at one end and threaded at the other.

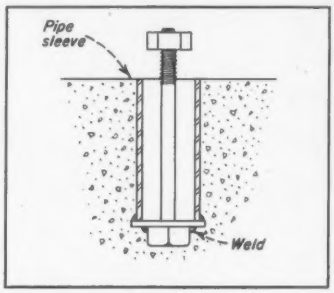


The designer specifies only the size and length. In the field, it is hard to place the bolts in fixed locations while placing concrete. Yet, fundamentally, the true function of an anchor bolt is its ability to hold to the desired position.

The projections of these embedded anchor bolts above the floor presents serious obstructions to correct shifting and moving of heavy columns or machines along the floor preparatory to their being anchored in place. Also, the work required to raise heavy columns and machines above bolt projections for centering and fitting into bolt holes entails extra labor and cost.

The construction industry needs an efficient anchoring or fastening method that can meet the following requirements: (1) Easy, quick installation, even by unskilled workers; fool-proof; and non-shifting. (2) No bolt projection above the floor. (3) No obstruction to construction of a perfectly smooth, flush and durable surface to receive column and machine bases, thus eliminating grouting under the bases after columns and machines are installed. (4) Full development of the structural strength of the bolts or fasteners, according to engineering requirements. (5) Flexibility for easy adjustment in all directions.

The only effort made so far is to provide some sort of flexibility in setting the bolt inside a pipe sleeve. This method merely gives more length and space for bending the projections of the embedded bolts to fit into bolt holes; but still they have to be bent by hand to get the desired fitting.



Is this anchor bolt problem too simple to be neglected? Or is it a worthy challenge to engineers to create a new, revolutionary anchoring or fastening method?

H. K. LEE
4838 *Underwood St.*
Detroit 4, Michigan

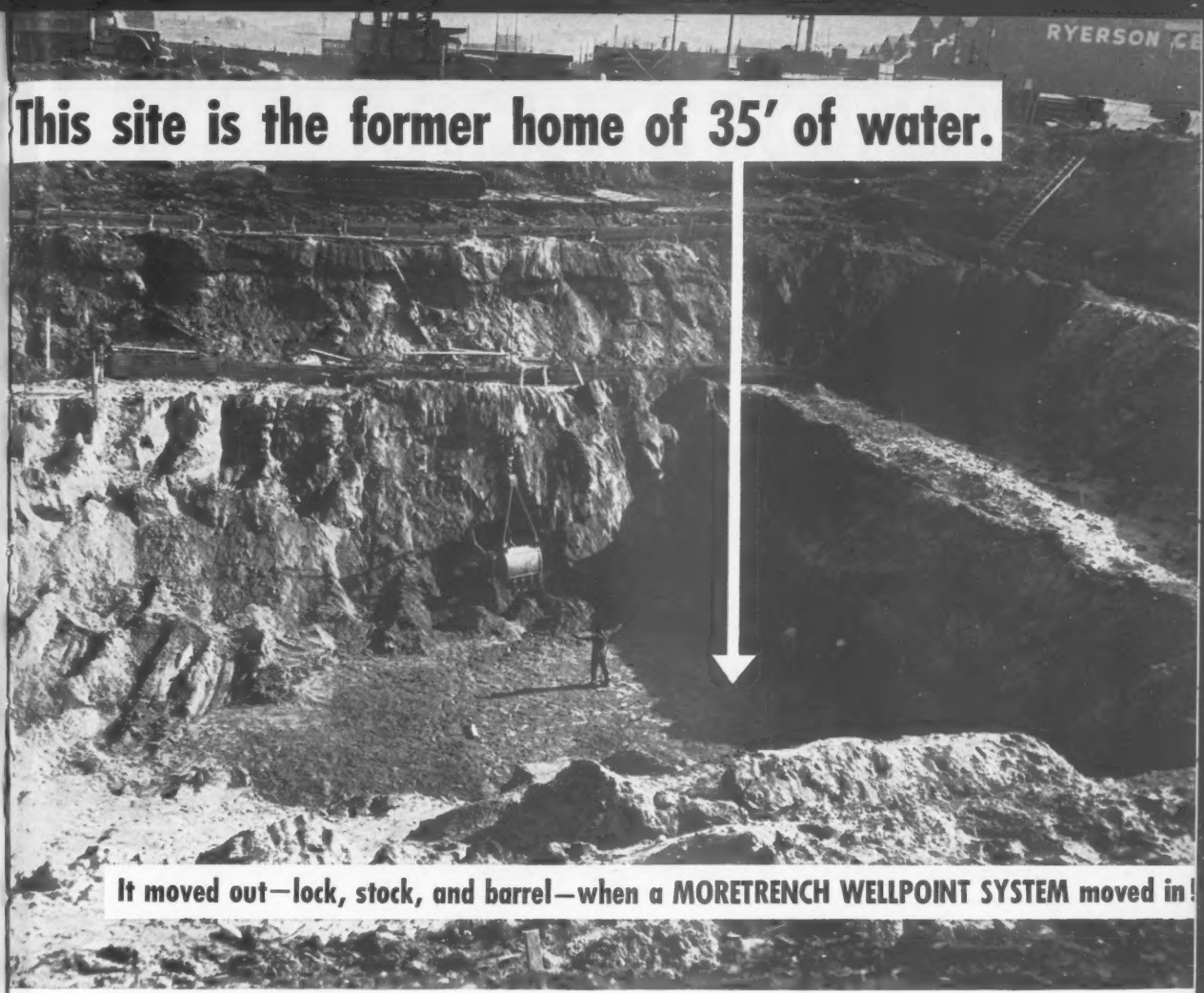
Job-freeze Abhorred

SIR—I am writing to congratulate you on the editorial in Engineering News-Record of May 2, "Error in Judgment". From the opening to the closing sentence I agree with you, all the way; and if most people fail to do so, I would be greatly surprised. In my opinion, the engineering profession owes you a vote of thanks for pointing out the error in judgement that brought about the anti-pirating clause for use in contracts between state highway departments and consulting engineers.

Personal liberty is a great drawing

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.


RYERSON
This site is the former home of 35′ of water.
It moved out—lock, stock, and barrel—when a MORETRENCH WELLPOINT SYSTEM moved in!

Rapid Digging IN THE DRY Speeds Construction of Jersey City's Sewage Treatment Plant.

Garden State Constructors and Associates, Jersey City, contractors for this portion of the city's $25,000,000 sewerage project, know how quickly water can sabotage the progress of any job. That's why for quick, sure results in this mixed-up material (garbage fill, sand, silt and clay layers), they selected Moretrench to do the pumping.

When you have to deal with water, deal with Moretrench. Experienced engineers in any of our offices will be glad to analyze your problem, estimate on your requirements. The know-how of thirty years of pumping is at your disposal.

Send for Catalog

MORETRENCH CORPORATION

90 West St. New York 6 | 4900 S. Austin Ave. Chicago 38, Illinois | 7701 Interbay Blvd. Tampa 9, Florida | 315 W. 25th St. Houston 8, Texas | Rockaway New Jersey

Western Representative: Andrews Machinery of Washington, Inc., Seattle 4, Washington

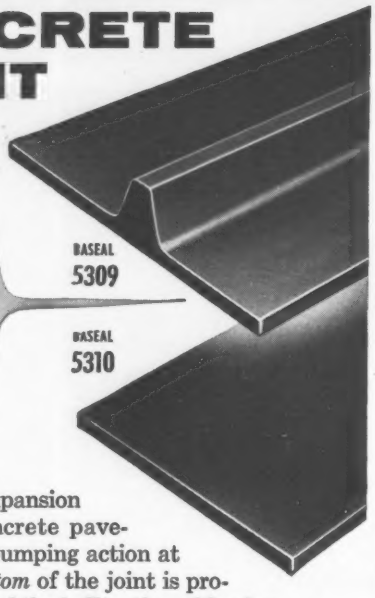
Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

SERVICISED

"BASEAL" rubber base plate

FOR CONCRETE PAVEMENT

Keeps Water And Foreign Materials From Entering Joint At Bottom...

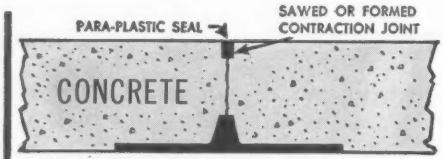


For maximum protection of expansion and contraction joints in concrete pavement, and the elimination of pumping action at joint intervals, be sure the *bottom* of the joint is protected against water seepage and the infiltration of foreign materials. Specify Servicised "BASEAL"—a resilient rubber base plate for expansion and contraction joints—made in two types, specifically designed for optimum performance and joint protection. "BASEAL" provides long-time protection because it is an extremely stable rubber compound, resistant to deterioration caused by fungus growth, etc.

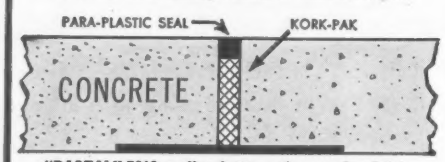
Installation is simple. "BASEAL" is merely placed over the compacted pavement base prior to paving. Due to its resilient characteristics, the material will conform to the terrain after concrete is poured.

"BASEAL" is available in continuous lengths of 26 feet. Standard width is 6 inches.

Drawings at right show Servicised "BASEAL" in place in expansion and contraction joints.



"BASEAL" 5309 sealing bottom of contraction joint



"BASEAL" 5310 sealing bottom of expansion joint

Write for the SERVICISED Catalog which illustrates and details Servicised products for highway and heavy construction work.

SERVICISED PRODUCTS CORPORATION
6051 WEST 65th STREET • CHICAGO 38, ILLINOIS

card for the engineering profession, and it certainly is at stake in this issue. It is abhorrent to me to find governmental agencies banding together in an effort to restrict the liberty of individual engineers from going wherever they are willing and able.

I have long agreed with you on your stand that turnover can first be stopped by paying adequate salaries. There is nothing wrong with the supply of civil engineers that adequate salaries will not cure. The road back may be rough for a while because the salary scale has been relatively depressed since World War II. A great many competent engineers did not return to state departments when released from the Armed Services because of salary. I decided this matter for myself at the end of the war when I did not return to my place as resident engineer for the Texas Highway Department. A great many others did exactly the same; and these men are those experienced engineers who would now be in charge of expanding parts of the great highway program had they stayed with various highway departments. I feel very competent in stating that I fully understand the dilemma of the states, but "righting" an error with an imposition on personal liberty is absolutely the wrong thing to do.

RICHARD C. COOK
Los Alamos, N. M.

Savings Questioned

SIR—The title of your article on the John H. Kerr Dam "Change Saves $32,000 a Year" (ENR April 18, p. 34) is misleading. Actually, according to the following paragraph, the change cost $80,000 and resulted in no overall saving. This is apparent from the second sentence which states: "Immediately, eight jobs totaling about $32,000 per year were eliminated—the men to be absorbed elsewhere."

The direct implication is that the professed $32,000 a year saving was strictly paperwork. To absorb the men elsewhere does not reduce the Corps of Engineers' payroll or our taxes one bit.

DANIEL B. DINGMAN
Halvorsen and Dingman
Whittier, Calif.

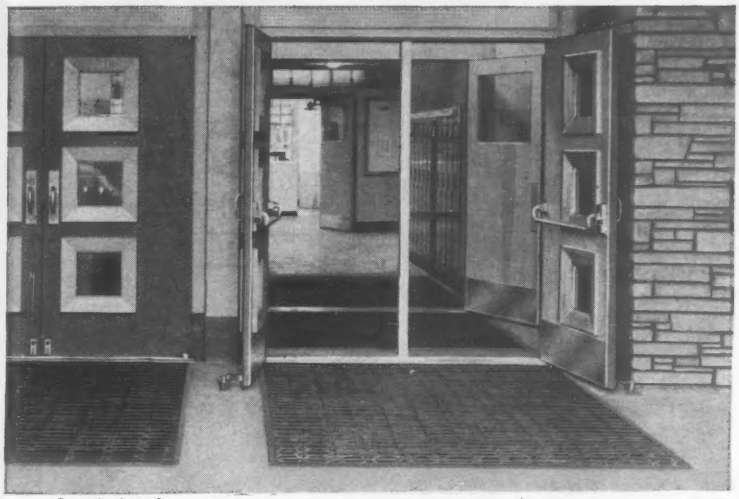
CALENDAR

Air Pollution Control Association, golden jubilee meeting, St. Louis, Mo., June 2-6.

American Society of Civil Engineers, spring convention, Hotel Statler, Buffalo, N. Y., June 3-7.

Annual Meeting of American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J., June 16-21.

NEW ARCHITECTURAL USES for IRVING GRATING



Centralia Jr. H. S.
Centralia, Wash.
Wm. Arild Johnson & Assoc.
Architects & Engineers

as VESTIBULE MATS

Thousands of feet are sure to track much grit, mud and wetness into schools and other public buildings. However, an entrance mat made of Irving Grating can solve this problem. Grit, rain, snow and slush drop through the open-mesh grating to receptacles below which can be flushed into sewers. Thus a clean entrance is always assured, and the cleanliness of the interior is in turn preserved.

More than 50 years experience gives the Irving Grating Company a knowledge of the grating business that enables it to find ever increasing applications for grating products in all types of building structures.

Some Other Architectural Uses:

Parapet screens and railings
Apartment terrace railings
Fence protection around industrial buildings
Fire-escapes • Sun deflectors and/or shades
Area gratings • Window guards • Room dividers

"A FITTING GRATING FOR EVERY PURPOSE"

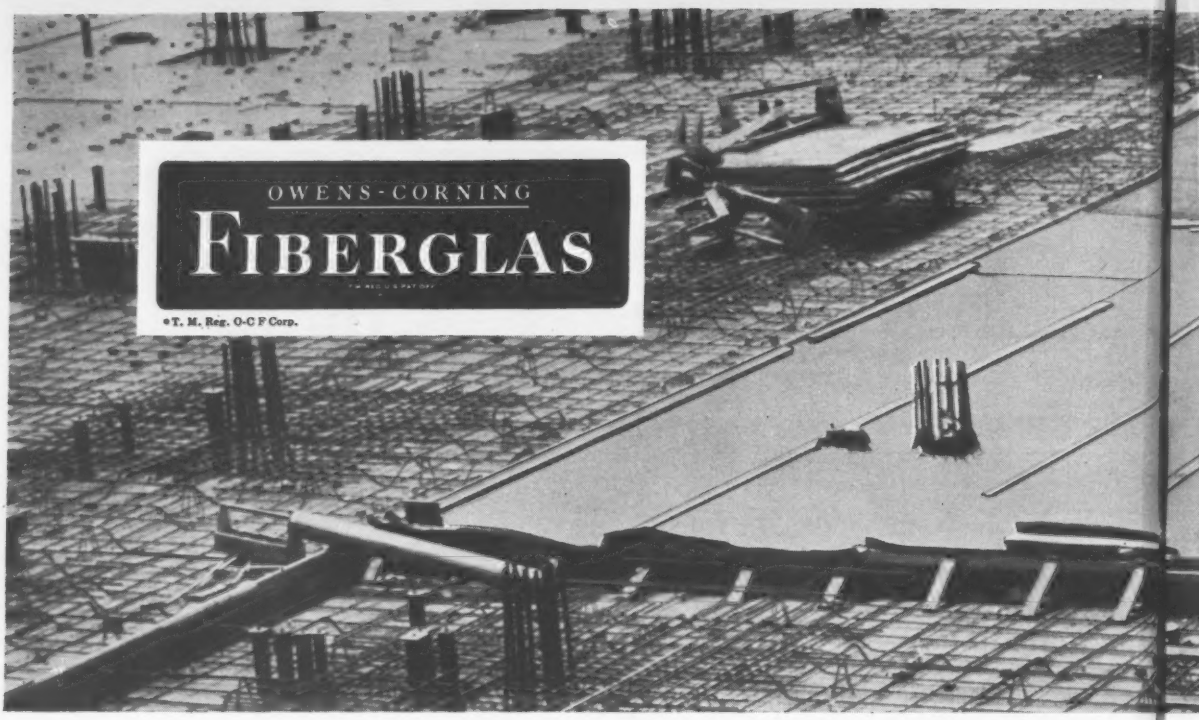
Consult local classified telephone directory in principal cities for nearest Irving Sales Engineer.

IRVICO®
ESTABLISHED 1902

IRVING SUBWAY GRATING CO., Inc.
ORIGINATORS OF THE GRATING INDUSTRY

Offices and Plants at:
5063 27th St., LONG ISLAND CITY 1, N. Y.
1863 10th St., OAKLAND 20, CALIFORNIA

Representatives in Canada, Mexico and South Africa



Here and now... AN ALL-PURPOSE W

Fiberglas-reinforced weatherproof paper gives you a low-cost answer to the problem of positive moisture control

TEMPORARY SHELTERS! Big savings in time, labor and materials are gained here through use of Fiberglas-reinforced weatherproof papers. Such shelters give long, dry service.

OUTDOOR STORAGE! Unbeatable moisture resistance of Fiberglas-reinforced weatherproof papers assures long-lasting protection of lumber and equipment.

Owens-Corning Fiberglas Corporation does not manufacture paper. It supplies the Fiberglas reinforcement to paper manufacturers.

CONCRETE CURING! Cleaner, harder and more durable surfaces can be obtained with Fiberglas-reinforced weatherproof papers. These light-weight papers can be re-used up to a dozen times, providing excellent cover at remarkably low cost.

SE WEATHERPROOF PAPER

More than ever before, today's builders and contractors clamor for versatile materials that do more than one job. They've hit a bonanza of applications with economical, super-strong Fiberglas-reinforced weatherproof papers.

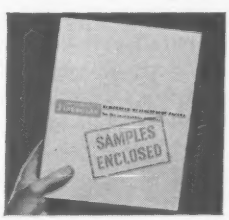
It's amazing the difference Fiberglas makes in reinforced papers for concrete curing, vapor barriers, sheathing protection and other applications. Wherever they're used, Fiberglas-reinforced weatherproof papers give you more value per dollar than any other type of reinforced paper.

At the heart of these flexible papers are moisture-proof Fiberglas reinforcing filaments — with the highest strength-weight ratio of all reinforcements. Weatherproof papers can be lighter in weight if they're reinforced with Fiberglas.

For all their versatility, Fiberglas-reinforced weatherproof papers cost no more than ordinary reinforced papers. Start right now to benefit from the extra protection and important economies they can give you.

SUB-FILL COVER! Even heavy construction traffic won't rip or tear Fiberglas-reinforced weatherproof papers used to separate slab from ground.

FREE!
SEND FOR NEW SAMPLE KIT
of Fiberglas-reinforced weatherproof papers, including complete listing of manufacturers. Address Owens-Corning Fiberglas Corporation, Dpt. 145 B-28, 598 Madison Ave., New York 22, N. Y.



for longer valve life

in a variety of corrosive services

JENKINS NI-RESIST GATE VALVES

Where you encounter acids, salt and alkaline solutions, sea water, brine or other corrosive fluids, vapors or gases, you'll want Jenkins Ni-Resist Type 2 Cast Iron Gate Valves with type 316 stainless steel trim. They have a remarkable ability to withstand destructive corrosion and erosion.

In paper mill service, food processing, petroleum refining, chemical plants and other process industries, Jenkins combination of Ni-Resist type 2 cast iron and type 316 stainless steel, plus Jenkins extra *value* construction throughout greatly extends valve life.

Designed especially for corrosive services, the Jenkins Ni-Resist line of gate valves also has superior metal-to-metal wearing qualities. Copper-free, they will not discolor or contaminate products being carried in the line. Let the famous Jenkins Diamond be your guide when choosing Ni-Resist valves . . . it means longer, trouble-free service.

GET COMPLETE INFORMATION

from your Jenkins Distributor, or write Jenkins Bros., 100 Park Avenue, New York 17.

JENKINS

LOOK FOR THE JENKINS DIAMOND

VALVES

TRADE JENKINS MARK SINCE 1864

Jenkins Bros

Sold Through Leading Industrial Distributors Everywhere

ENGINEERING NEWS-RECORD

Vol. 158, No. 22 May 30, 1957

Number of copies printed this issue: 77,689

CONTENTS

NATIONAL AFFAIRS

Safety Saved Cash on Lincoln Tunnel Job..... 21
New Orleans City Hall Dedicated..... 22
Tornado Disasters at Kansas City..... 23
Midshipmen to Open New Field House..... 25
Builders List Ways to Cut House Costs..... 26
Part of Seattle to Create Industrial Land..... 28
Aluminum Mesh for Facing of Office Building... 29

FEATURES

Consulting Engineers Build an Office Building for Themselves 32
Oil Refinery Gives Complete Treatment to Wastes 39
Precasting 35 Acres of Roof Panels for Warehouse 42
Mud—40 Feet Deep—Makes Bridge Costly..... 46

MEN AND JOBS

Walter Underwood Named Executive Director for Concrete Association 51

INTERNATIONAL

Brussels, Readying for World Fair, Pushes Traffic Engineering 58

FIELD AND OFFICE

Microwave Radio System Used for Long Distance Surveying 80

BUSINESS AND FINANCE

Localities Push Industrial Sites at Exposition.... 104
Construction Market: Jackson, Mississippi..... 106
Design Approved for $46 Million CIA Building.. 109
$32 Million Shopping Center Planned for Atlanta 110

LABOR

Teamsters Given Chance to Remain in AFL-CIO.. 112
Long-Term Labor Pacts Continue..... 112
Building Trades Unions in Safety Experiment.... 113
Operating Engineers Suspended from Canadian Labor Congress 114

Reader Comment.... 10 | Books 76
Calendar ..... 12 | Unit Prices 85
Washington Observer 19 | Materials Prices 88
Obituaries ..... 57 | Construction Reports. 90
Legal ..... 69 | Scoreboard 102
Editorials 132

Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Price 50¢ each copy except Annual Cost Issue. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

LOW BIDDER PROTESTS ESTIMATE—The government estimate of $6,812,627 as the cost to construct Eagle Gorge Dam on the Green River near Seattle, Wash., has drawn a protest from Peter Kiewit Sons' Co., low bidder for the project at $10,874,360. If it were not for the protest, the Seattle District of the Corps of Engineers would be required to reject the Kiewit bid, as it is more than the allowable 25% above the estimate. But rejection of the four bids received May 10 would delay the project and might result in higher costs, contractors declare. The engineers' estimates vary widely from several unit prices bid. Many of the variations, however, are due to suppliers' estimates which were revised considerably from their original values. Example: Gates estimated at $35,000 were bid at more than $100,000.

"HAT" AND "TENT" BOTH NIXED—Arizona legislative chiefs had only frowns last week for two proposed designs for a state capitol building. The lawmakers want no part of a 20 story skyscraper with a dome on top (ENR April 11, p. 27), which part-time Arizona resident Frank Lloyd Wright termed "a hat on a post." Nor do they approve architect Wright's alternate, a sprawling one-story "Siamese tent in the desert." But they want to come up with some kind of plan, a spokesman indicated, before Wright musters popular support for his design.

TRADING STAMPS NEXT?—With the volume of offerings outrunning the demand, there is a buyers' market right now in municipal bonds. Yields have been going up, have now reached the highest levels in two decades. But still the investors have been holding back. So, last week, one Wall Street bond house borrowed a merchandising gimmick from the supermarkets, offered a dozen free golf balls to any purchaser of a municipal bond. So far, none of the potential bond buyers has demanded trading stamps. But, it's an interesting thought.

GLASS-WALL OPPOSITION OVERRULED—The Buffalo, N.Y., Common Council last week resolved a two-year battle by voting to permit construction of a 20 story glass-walled office building. Over the opposition of Bricklayers Local 45 and the Buffalo Federation of Labor, the council acted favorably on a recommendation of Public Works Commissioner George J. Goetz and a Common Council subcommittee to grant the necessary building-code variance to Tishman Realty & Construction Co., owner-builder of the proposed structure.

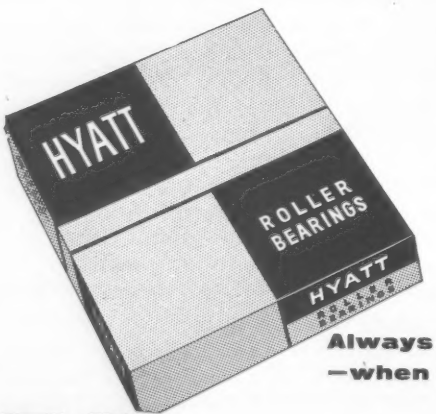
Always replace a HYATT with a . . .

HYATT

WHY? In the first place, it's easier and quicker to install another HYATT Hy-Roll than another make. You're sure of a perfect fit—because HYATT Hy-Rolls are precision-built and they're *completely interchangeable.*

But far more important, you're sure of the same long, smooth, dependable bearing service the manufacturer originally built into his product. The reason he specified HYATT Hy-Rolls was to assure you the best possible performance. *Isn't that a good reason for you to specify them again?* Hyatt Bearings Division of General Motors, Harrison, New Jersey.

Watch "WIDE WIDE WORLD" Sundays on NBC-TV



Always look for the familiar blue and yellow box —when it comes to quality, there's no substitute for

AVAILABLE THROUGH UNITED MOTORS SERVICE DISTRIBUTORS EVERYWHERE

GM PARTS SALES

HYATT HY-ROLL BEARINGS FOR REPLACEMENT

WASHINGTON OBSERVER

- Miles, money to be added to road net
- Seaway to get borrowing authority
- Engineer's chances for TVA spot slim
- Budget slash nips construction statistics

- **The drive to add additional miles to the highway construction program is making progress:** The Senate public works subcommittee on roads has approved the addition of 7,000 miles to the present 41,000 mile interstate network.

  This would add about $17 billion to the program according to present estimates—of which the federal government's share would be $15.4 billion. To take care of this the committee would stretch out the construction over a 20 year period, instead of the 13 to 15 years now called for.

  Also, states would get their allocation upped to 90.75% of the cost of interstate network construction if they limit billboards and signs within 660 feet of the paved surface of the super highways.

  A bill won't be passed this year, but probably will next year.

- **St. Lawrence Seaway Corporation will get the additional $35 million in borrowing authority it has asked of Congress.** Last week the House Public Works Committee approved the full request. The legislation is needed to take care of added costs that have been encountered as construction moved along. Original authorization was for $105 million.

  Chances are that the new total of $140 million won't be enough to finish the job, and the corporation will have to come back to Congress again for one more increase. Total bill should be calculated accurately by next year; plans call for full operation by mid-1959.

- **Chances of an engineer becoming a director of TVA are slim.** There had been talk about Adolph J. Ackerman, Wisconsin consulting hydroelectric engineer, for the vacant spot on the three man board.

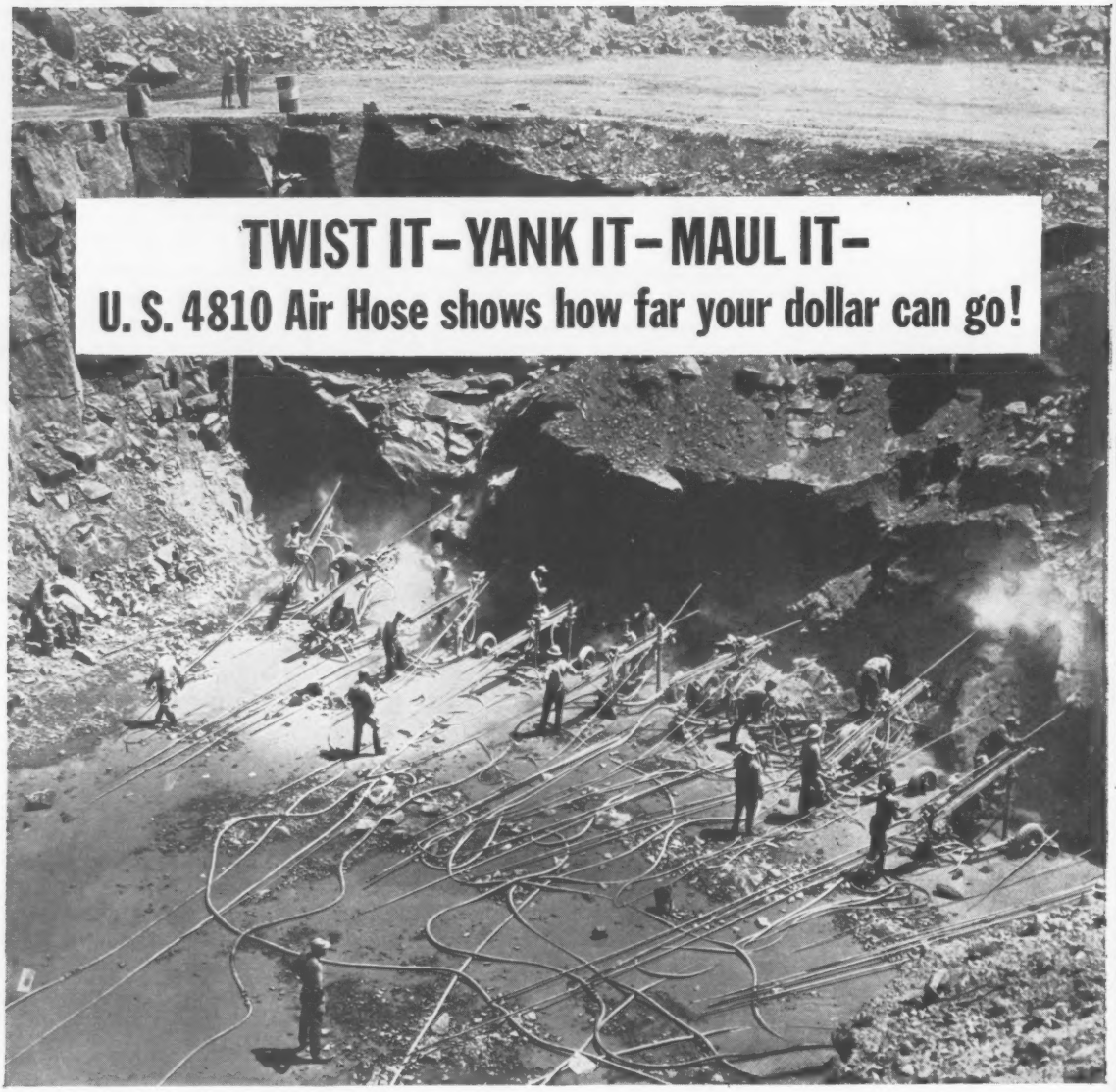
  Big hurdle is the fact that TVA Chairman Vogel is an engineer and his political opponents in Congress say they won't take another man with this background. The President has to find someone who won't give the Democratic TVA bloc cause to fire up again the public vs private power fight, the Dixon-Yates situation, and the like. The President has been seeking a middle-of-the-roader.

- **Construction statistics of the Commerce Department will be but slightly hurt by the big budget slash being voted by Congress.** Overall, the Business and Defense Services Administration is getting one-third less than it asked for; this means losing one-third of its staff, or more than 100 people.

  But the construction statistics shop will keep 16 people on the job, including seven professional employees. There will be no reduction in the program at all. (No money was even sought this year to improve the figures, which all hands agree should be done.)

  This means that about six jobs will be eliminated of the 12 assigned to non-statistical projects inside the Building Materials and Construction Division. This reduction will hurt preparation of plans for better construction cost indexes and research into improving other data.

AIR HOSE



TWIST IT–YANK IT–MAUL IT–

U. S. 4810 Air Hose shows how far your dollar can go!

This is the hose recommended for all pneumatic tools and air drills—for use wherever high working pressures, abrasion and general abuse would wreck an ordinary air hose.

Heavy tools can drop on it. Pieces of rock from blasting can strike it. It can be pulled over jagged stones, grinding gravel—in all kinds of weather. *Throughout all this, U. S. 4810 stays unharmed, delivers full service.*

U.S. 4810 combines super adhesion and extreme flexibility. The rugged service that this hose provides throughout its long life proves that you are wasting dollars if cheaply constructed, short-lived air hose is being used instead of U. S. 4810 Air Hose.

A complete line of hose is obtainable at any of the 28 "U. S." District Sales Offices, at selected distributors, or by contacting us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.

Mechanical Goods Division

United States Rubber

Traffic turns here . . .

To enter world's safest tunnel job. New signs mark entrances to Third Tube of Lincoln Tunnel, where the top news is . . .

Safety Story: Good Record Means Cash

Proof—in the form of cold, hard cash to the amount of $1.3 million—of the value of a real construction safety program was the top story for construction men this week.

It came as the Port of New York Authority formally opened its Third Tube to the Lincoln Tunnel under the Hudson River. As the ceremonies were completed, PNYA leaned back and took a look at the ledgers. It had been prepared to spend an even $100 million, however, the estimated total cost turned out to be $94.5 million.

In addition, construction of the tube was finished well within the scheduled completion date.

Without precedent in the history of major underwater shield-driven tunnels, the work was completed without a single fatality under air pressure in the hazardous underwater section and only one on any of the roughly 400 contracts that were necessary for the complex approach system, fittings and other appurtenances. (One other worker—an electrician—died on the job, before excavation began. His death, however, was ascribed to a heart attack.)

• **Bigger than it looks**—The real saving as a result of the safety program (ENR june 16, 1955, p. 42) is in fact much greater than it appears to be. It is a direct outcome of a unique insurance arrangement whereby PNYA undertook to act as insuror for all of its contractors on the work—thus giving the bi-state agency working control of safety operations, and the advantages of a single big-premium account.

According to Austin J. Tobin, Executive Director of PNYA, it worked out this way:

Acting as general insuror, the authority estimated that its total insurance costs would be $4.5 million for the job. Last week—because of the safety record—the Indeminity Insurance Company of North America presented Donald V. Lowe, authority chairman, with checks totaling $1,306,506 as refunds on the premium. Thus total actual cost of insurance to date is slightly less than $3.2 million.

"But," commented Mr. Tobin, "if we had followed normal procedure and asked the contractors to obtain their own insurance, the cost of the insurance would have been more than $8 million. That cost, of course, would have had to be reflected in bid prices, and so the estimate for construction would have been $104 million."

• **Other savings**—Although nearly a third of the savings were thus accounted for by insurance refunds, the remaining cutback was achieved through three principal avenues, according to agency financial officers.

Final figures are not yet available, but equal saving factors were these:

Slightly lower than anticipated land acquisition costs.

Revenues from properties acquired by condemnation but then operated for a time before demolition.

Engineering changes that affected the actual construction.

John M. Kyle, chief engineer for the authority, commented that the engineering savings were "many and small" but they added up to a substantial sum. Some economies were suggested by the contractor, such as the method of flushing out the tunnel to clear debris (ENR Sept. 20, 1956, p. 30), others by authority engineers. "We watched costs as closely as if we were running a small store," said Kyle, "and we shaved a few dollars here, short-cut an expensive process there."

• **Safety first**—But it was the safety program that caught most attention as the big job wound up.

A comparison with fatality records on other tunnels of this type is necessary in order to show just how remarkable the Third Tube record really is. And to show that it is possible to nullify what has been a long-standing fact: In tunnelling work of this kind, a man's life will be sacrificed for just about every $5 to $10 million worth of work.

(*Continued on page 22*)

. . . Safety story: Good record means cash

The Holland Tunnel, completed in 1927 at a cost of about $48 million, took eight construction workers' lives. The first two tubes of the Lincoln Tunnel, completed in 1937 and 1945, cost about $88 million and seven lives. The $83 million Brooklyn-Battery Tunnel, completed in 1947, cost eight lives. The Queens-Midtown Tunnel under the East River in New York cost $53 million and seven lives.

A study of records of these jobs—and conversation with such experts as Ole Singstad, who was chief engineer of the Holland Tunnel work for a predecessor of the present-day Port Authority—makes the record more remarkable still. Says Mr. Singstad: "Few, if any, of the men killed on the Holland Tunnel died because of the conditions under which they were working. They died because of carelessness—their own or that of someone else on the job.

"Three were killed, for instance, during demolition of some of the old structures on the approach plaza in Manhattan; one was killed when someone turned off lights while he was working on a high scaffold over a shaft; another was crushed when a skip descended on him while he was standing in the shaft."

• **How it was done**—The no-fatality record on the third tube was the result of close cooperation between the insurance company and the authority—but particularly the result of the authority's designation of a single man as safety engineer, with full authority from Kyle and other high officials to carry out any necessary step for safety.

Under that man—Vincent J. Mooney—union officials from presidents down to shop stewards were made part of the safety organization, meeting with their opposite numbers in the contracting and engineering forces, with authority to settle safety matters on the spot.

Slogans were used, but devices such as Polaroid Land Cameras that produced instant pictures and no negatives (which thus removed workers' fear that photos would be used against them) were utilized to emphasize safety violations. A constant "personal touch" was maintained throughout the three-year course of the job to keep workers conscious of the dangers with which they were surrounded and their need for constant care.

In addition, the Port Authority's fully equipped hospital—with its decompression chamber and complete medical service—was maintained at top grade throughout the job, and strict physical examinations were the flat rule. Because the authority itself controlled the insurance, there was no question of its right to enforce safety provisions on all concerned.

• **Statistics**—As completed, the Third Tube is a tunnel 8,013 ft long, portal-to-portal. Of this length, 1,750 ft is a cut-and-cover tube on the Manhattan Island side from the tunnel plaza to the ventilation building; xxxx ft is rock tunnel from the New Jersey bank of the river to the toll plaza.

The under-river section, was driven behind a 31 ft 8 in. dia shield with the men working under air pressure as the shield was pushed through the soft silt of the river bottom. Other sections of the whole job included the addition of a full traffic lane to the 360 deg elevated structure ("the helix") that climbs to the top of the Palisades on the New Jersey shore, and an 8 block expressway approach system blasted out of Manhattan's rock, and through the closely built West Side area.

The new tube is just south of the existing two tubes of the installation. It was originally intended that the existing south tube—which now becomes the center artery of the three—would be a reversible facility. Its two traffic lanes were to be made eastbound (toward the city) during morning rush hours, westbound in the evening. Most recent traffic surveys however, indicate that there has been an equalization of rush hour traffic flow, so the tube will ordinarily be operated in two directions. The existing north tube will remain westbound, and the new tube will be for east bound traffic.

Major contractors on the job include the joint venture of Mason-Johnson-MacLean (Mason & Hangar Co., Arthur A. Johnson and MacLean-Grove); Gull Contracting Co.; Grow Construction Co.; Cayuga Foundation Corp.; and Bethlehem Steel Co. which supplied the heavy tunnel segments that form the main skeleton of the underwater section.

New Orleans Civic Center Advances

The dedication on May 6 of a new city hall *(1)* marks the completion of the first of five buildings to comprise the civic center in New Orleans.

The $8 million building departs from the customary Greek style. Windows form an almost solid wall of glass across the front of the 10 story structure. Solid walls are faced with limestone. Windows on the rear of the hall are protected from the sun by vertical louvers. The building is completely air conditioned.

Among other buildings to be located in the center is a $1.8 million, 2 story state supreme court building *(2)* marked for completion later this year. And steel work is being erected for a $4 million 8 story state office building (3), which is expected to be completed next year.

Proposed for future construction is a $2 million civil courts building *(4)*. Excavation is underway for a $2.5 million library building *(5)* not shown.

The firms of Goldstein, Parham & Labouisse and Favrot, Reed, Mathes & Bergman were the architects for the city hall building. R. P. Farnsworth and Co., Inc., was the general contractor.

Tornado Disasters at New High

Kansas City experience of last week also emphasizes that sturdy buildings are no match for twister forces

About 100 people have been killed by tornadoes and more such storms have been reported this spring than in any comparable period on record. According to the Weather Bureau, 431 wind funnels had been sighted up to May 22, compared with 392 reported in the first five months of 1955. That was the year of greatest incidence, 870 being recorded for the entire twelve months. There were 823 reported in 1956, the second highest year, and 690 in 1954, so that this year's tornado experience is by no means ended. So far, the region most affected includes Texas, Oklahoma, Kansas and Missouri, but Nebraska, Colorado, Tennessee and Kentucky have also suffered in the past two months.

According to unofficial tabulations, 98 persons have lost their lives in 1957 tornadoes. In April in Texas, 65 separate tornadoes were recorded, 11 people were killed and property damage reached $6½ million. In May, one of the 13 tornadoes in Texas hit the town of Silverton, with a loss of 21 lives. But the most serious group of storms, from a damage and loss of life standpoint, occurred last week in Missouri when 37 people were killed in suburban towns south of Kansas City, and 14 lost their lives in communities south of St. Louis.

Except for the Kansas City storm and one earlier which skirted the edge of Dallas, this year's storms have not threatened large communities. Fortunately nothing has yet occurred to compare with the week in June 1953 when tornadoes hit close in at Cleveland, Ohio; Flint, Mich., and Worcester, Mass. In the Flint storm alone, 100 persons were killed, 90 lost their lives at Worcester. In all three cases major buildings were damaged along with the usual devastation of residential structures.

In the tornado of May 20, which struck suburban communities south of Kansas City, 500 houses were completely demolished, 175 suffered major damage and an additional 350 were damaged in a lesser degree. Business buildings and schools were also victims of the twister, including the entire business district of Martin City, much of the business district of Hickman Mills and virtually the entire Ruskin Heights shopping center. The schools hardest hit were the adjacent junior and senior high schools, the latter only a year old, at Ruskin Heights. School architects estimate that the replacement of both units will cost about $3 million.

SWATH of complete destruction in Kansas City suburb. Only the main arches of the Ruskin Heights High School gymnasium remained standing after the twister passed.

Again, as in previous tornadoes, there was evidence of virtually irresistible forces.

One engineer has estimated that in order to flatten the senior high school at Ruskin Heights it would have required forces equivalent to a 500 mph wind velocity.

At the same time, in the very center of the destruction at Hickman Mills, an elevated steel water tank was left standing with only minor damage. Steel fencing surrounding the tower was blown down and rolled into a jumbled mass around the riser pipe and legs, attesting to the fact that the tower was not missed by the wind. The elliptical bottom tank on a 242 ft tower had a capacity of 400,000 gal and was about three-quarters full, supplying considerable weight. Also the eight tower legs were tubular, affording minimum resistance to the wind.

Representatives of mortgage firms and insurers in the area along with home association officers have worked out a plan for rebuilding. Home owners will sign an authorization to the mortgage firm for restoring their homes to pre-tornado status. The company then will work out insurance details and, in the case of Ruskin Heights, will instruct the construction firm of Praver and Sons, which originally developed the community, to begin cleaning up and rebuilding.

Five hundred carpenters moved into Ruskin Heights on May 24, to be followed by perhaps 1,500 other building craftsmen before the job is finished. Although the carpenters have been on strike in Kansas City, union officials granted them permission to return to work in the disaster area under the pre-strike wage scale.

Rains Pose New Flood Threat

Torrential rains last weekend—up to 8½ in.—caused a new general flood threat in the Texas-Oklahoma area. By Monday as ENR went to press, 25 reservoirs in the Corps of Engineers Southwestern Division had reached record levels and eight of these, mostly in the Dallas-Fort Worth area, were overflowing their spillways. And weather forecasts predicted still more rain this week.

The new rains drained to rivers still swollen from sudden rains and flooding during late April and early May (ENR May 9, p. 29). Current flooding is widespread: thousands of Fort Worth and Dallas residents were being evacuated; Highway 70 near Denison Dam (Lake Texoma) on the Red River in Oklahoma was near washout, and large amounts of farmland have been inundated.

All of the rivers that were in flood earlier this month are in the same condition again. This includes the Colorado, Brazos and Trinity Rivers in Texas, the Canadian and Red Rivers in Oklahoma and Arkansas and the Arkansas River in Kansas, Oklahoma and even as far north as Missouri.

• **Damage not estimated**—It was too early for new Army Engineer damage estimates. The $57.5 million damage and $100 million damage prevented estimates in the five state Southwestern Division reported through May 6 were the latest made.

According to Brig. Gen. L. E. Seeman, Southwestern Division Engineer, last weekend's rains would have combined with the already swollen Trinity River to have produced the greatest flood in Dallas' history were it not for the control of three recent reservoirs above the city.

Again there was a bright spot to the floods. Subsoil conditions over most of Texas are now very good, according to State Agricultural Commissioner John White. But, he warned, you don't cure seven years of drought with good spring rains in just one year; dry weather occurring through the balance of the growing season could undo most of the current good.

Rail Loop Seen As Transit Need

$400 million project called solution for N. Y. traffic snarl—but system probably will operate at a deficit

Plagued by the transportation problems inherent in its population of more than 15 million the two-state New York metropolitan area this week had before it a $400 million plan to remedy the situation.

The proposal emphasized rail rapid-transit—but made a point of its prediction that the rail loop suggested would run at a yearly deficit that would have to be paid as a subsidy by the communities to be served.

But the alternative to the rail loop, said the report, would be the eventual construction at far greater cost of 10 new vehicular tunnels under the Hudson River, at least 20 new expressway lanes through the heavily congested New Jersey riverside communities and 250 acres of added parking space in solidly built-up Manhattan Island.

The report was presented after nearly two years of study by the bi-state Metropolitan Rapid Transit Commission, which was created by the legislatures of the two states in 1954. The work was carried out under a $100,000 appropriation from the two states, and a $500,000 grant from the Port of New York Authority. Key points were:

- Creation of a permanent bi-state agency, with powers to improve transit between New York City and its suburbs.
- Extension, in effect, of the city's subway system into New Jersey through new tunnels under the river.
- Improvement of suburban railroad service in New Jersey with ties to bus and other transportation media.

Additionally, it was suggested that the related problems of commuting from Nassau and Suffolk Counties, on Long Island to the east of the city proper, be included in the overall plan for attention at a later date.

The Rapid Transit report followed by only two days a preliminary announcement by still another agency—the privately financed Regional Plan Association—on population trends and growth in the metropolitan area.

The Regional Plan report (which took into consideration communities in western Connecticut, Westchester County, and other nearby areas) estimated that population by 1975 will have mounted by 4 million over the present figures, to reach a total of 19 million persons. Such a growth, said the Regional Plan, will mean the "urbanization" of more than 700 square miles of additional land in the region.

• Growth, but no profit—In the context of that prediction of growth, the Rapid Transit Commission's prediction that a new subway loop would operate at an annual deficit of about $12 million was particularly startling.

But according to Arthur W. Page, who served as project director for the transit study, the subway loop and its extensions plus the taking over and modernization of the bankrupt Hudson & Manhattan Railroad—which serves Jersey City, Hoboken and Newark—will cost a total of $345 million. Cost of buying new cars, improving old ones, building and improving stations and providing parking spaces on the New Jersey side, will add another $55 million to the bill.

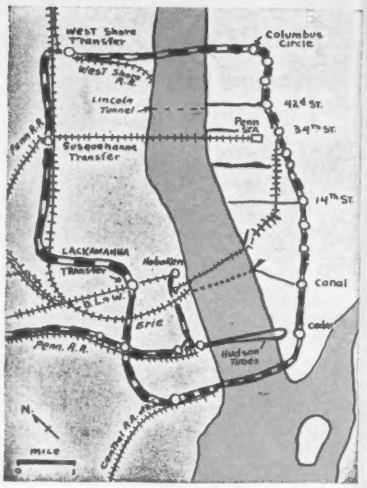
The fare suggested on the loop is 15 cents, with passengers paying another 15 cents when they arrive in New York City and transfer to the subway lines. With this fare structure, said Mr. Page, the new system would operate at a deficit.

Charles H. Tuttle, co-chairman of the transit group, added that transit experience in all major cities has indicated that such a system cannot be operated solely on income from its users, but must be additionally supported by the community that is benefited.

• Details—Heart of the plan is the railroad loop itself—a project that would require at least four years of construction work.

The new system would start in Manhattan Island at 57th St. and 7th Ave., connecting with existing lines of the city-owned BMT Subway Division. From this point, the rail loop would cross under the Hudson River in a two-track tunnel that would carry to a point about a mile west of the high bluff of the Palisades that fronts the river. From this point, the loop would turn southward for a distance of about seven miles, making connections at five points with the five major commuting railroads that feed the city from the west. Then, at a point just south of the existing Hudson and Manhattan Tunnels, the loop would plunge under the river again to rejoin the city subways near Cedar St. in the heart of Manhattan's financial district. Loop cars would continue the circuit, running on subway tracks.

Engineers commented that the three H&M tunnels now under the river cannot be incorporated into the loop, since they are narrower than the standard subway tunnels, requiring special cars, and can't accommodate modern equipment. Expense of rebuilding them, and



their station facilities, would be far too great.

More than 150,000 commuters use the existing railroads, the H&M and ferries to reach the city each day. Transit Commission experts hoped that with improved communications directly to the city, more persons can be induced to abandon private automobiles to use the new facilities. A shutdown of the two remaining ferry lines is contemplated, once the loop is in operation.

Funds to finance the work would have to come from a bond issue—but the two states would have to back the issue fully, since it is already concluded that the system cannot produce a profit. The suggested permanent commission would be governed by a 32 man council, consisting of representatives of the city, and of the counties involved.

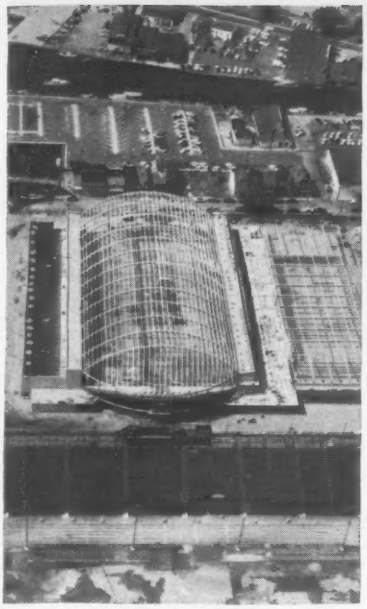
Controversy Continues On Turnpike Extension

A controversy over extension of the Massachusetts Turnpike from its present terminus west of Boston into the downtown area of the city went a step further last week, when turnpike officials insisted that the tollroad must be extended.

Said William R. Callahan, chairman of the Turnpike Authority: "It is my intention to do everything in my power to build this extension. It will be the salvation of downtown Boston." Added Philip H. Kitfield, chief engineer for the pike: "The turnpike must be extended into Boston and fast."

The extension has been attacked by residents of Boston suburbs, especially Newton and Brookline, who object to the potential loss in real estate taxes.

Another plan, that would extend the road into Boston along the right-of-way now used by the Boston & Albany Railroad, has been opposed by commuters who are afraid of being left without suitable train transportation.



U.S. NAVAL ACADEMY FIELD HOUSE, shown at left under construction and at right, ready for its official opening.

Annapolis to Dedicate New Field House

Next week, just in time for year-end festivities at the U. S. Naval Academy, the midshipmen will get a brand new $4 million field house.

The 158,000 sq ft structure will be dedicated in a five-minute ceremony at Annapolis June 5. Graduation ceremonies take place two days later.

Dominant feature of the project is the barrel roof of the main arena. About 170 ft wide and 370 ft long, the arched structure overlooks from a height of 75 ft flanking 2 story sections.

Principal framing members of the cylindrical roof are three-hinged steel arches. There are 12 of them, spanning 169 ft and spaced 25 ft apart. The arches are supported at first-story-ceiling level by concrete buttresses, which continue through the first story to the foundations.

Between the arches are steel purlins. The roof deck is wood-fiber-concrete plank, covered with copper roofing. Flat roofs are built-up.

The arches and other frame members were fabricated at Trenton, N. J., by the American Bridge Division of U. S. Steel Corp., and floated to the job by barge. The steel was erected by McDade Rigging & Steel Erection Corp., of Baltimore. The building was designed by an architect-engineer combination of several firms using the name of Harbeson, Hough, Livingston & Larson, Von Storch, Evans, Scandale & Burkavage, of Waverly, Pa. William E. Cramer Co., Washington, D. C., was the general contractor.

STEEL ARCH RIBS, hinged at center, were fabricated from 33 in. WF beams.

CURVED END WALL follows arch curve, thus making all sloping beams parallel.

CURVED CONCRETE ABUTMENTS support arch bases at ground-floor-ceiling level.

Builders List Ways to Cut House Costs

Job-tested procedures effect savings in construction, land development, business management, taxation and finance that can total to $50 to $150 per house

Homebuilders picked up scores of ideas in Washington last weekend for trimming the high cost of housing. Money-saving suggestions popped up all over the place during a how-to-do-it clinic put on by the National Association of Home Builders as part of its spring board of directors meeting.

There was nothing theoretical about the savings suggested. In a rapid-fire exchange of information, some 300 directors and members traded ideas that had cut costs and saved money for their own companies in land development, construction, business management, taxation and finance. And they carried away with them hundreds of additional ideas in a 90-page book that had been freshly compiled for the meeting.

Construction savings alone ran up to impressive figures. There was a steady stream of techniques that could cut per-house costs by $50 to $150 each. If a builder could apply a dozen of these practices that he is not now using, he might bring his house cost down by a thousand dollars. Even to homebuilders whose construction costs are already low, the fresh ideas open the door to further cost reduction.

On major builder outlays, the sessions brought out big savings made through better business organization and budget control, consolidated borrowing to reduce financing costs and proper corporate setup for minimum taxes. In subdivision planning, too, several participants stressed the wisdom of getting layouts from more than one land planner and then making a final review in the builder's office. This kind of advance study often pulls a few more lots out of high-priced acreage.

• **Better management**—Some of the construction ideas were broad enough to blanket building operations of all types and sizes. Joseph Goldman, of American Community Builders at Park Forest, near Chicago, told how his firm increased productivity and eliminated pilferage. Mr. Goldman broke up the organization's big construction forces and farmed out the work in small parcels to numerous subcontractors, many of them promoted to their new status from former jobs as foremen.

Similarly, Bill Underwood of Jackson, Miss., cut completion time more than 60% by putting a management man who knew nothing about construction in charge of the building schedule. Free of any inbred industry attitude toward subcontractors and suppliers, this schedule manager insists that materials and crews reach the job at the time agreed on and that each subcontractor complete his part of the work by the date and hour previously accepted.

Mr. Underwood's firm now finishes a 1,500-sq ft house in three weeks, a time schedule that has been found more economical than the two-week minimum actually attained two years ago. When the schedule czar began functioning, the best time on a 1,000 sq ft house was two months.

• **Four ways to save**—Ray Cherry, Los Angeles builder, outlined four ways to save $150 or more per house. His firm uses them all.

1. A daily cost-control system that tells the superintendent every morning what the costs are to date on each house and each subcontract. The system costs $1 per worker per week to operate.

2. Good supervision with a bonus to men on the job who beat cost estimates. The men get 40% of any savings.

3. Good use of progress schedules and sequence charts that enable subcontractors to plan their buying with certainty of progress and final payments from the builder on scheduled dates.

4. A reputation for paying promptly results in lower bids that save the builder 5% to 10% on subcontracts.

• **A wealth of ideas**—Other homebuilders pinpointed tested ways to cut construction costs. Here are some suggested procedures:

Foundations—Use grade beams on piers, instead of continuous footings for foundation walls and for slab jobs. Reported savings—$100 to $125 per house.

Place concrete basement floor integrally with footings or grade beams, thus giving wall masons a dry work space and cutting costs as much as $125.

Reduce span between foundation walls to permit using cantilevered joists of 2 in. less depth, thus dispensing with one brick course in exterior walls, at a saving of $50.

Framing—Some builders stressed savings through prefabricating wall panels and nail-glued trusses—up to $100 or $150 on materials and even more on labor, using dry wall construction and eliminating load-bearing partitions.

Turn 2 x 4 studs flat in partitions to gain an additional square foot of usable floor area for every 6 ft of partition.

Set back the exterior wall frame on the subfloor to bring the wall sheathing flush with the boxed-in joists, thus saving sheathing equal to the depth of the joists.

Use a double 2 x 10 lintel or band around the house as a time and cost saver that eliminates cutting and framing window headers. An alternate suggestion: Use double 2 x 12 headers of less expensive lumber over windows.

Buy lumber in volume, banded to prevent warping until used, at a saving of $25 to $50 per house.

Purchase carpenters scaffolding to save $25 to $50 wasted in building scaffolds out of job material.

Other components—Select materials that require the least labor; for example, metal doors and frames save $70 per house in fitting and framing, and metal windows finished both sides permit similar savings.

Spray painting saves $100 to $125 a house for some builders. Several report successful use of new single-coat paints in both sprayed and brush applications.

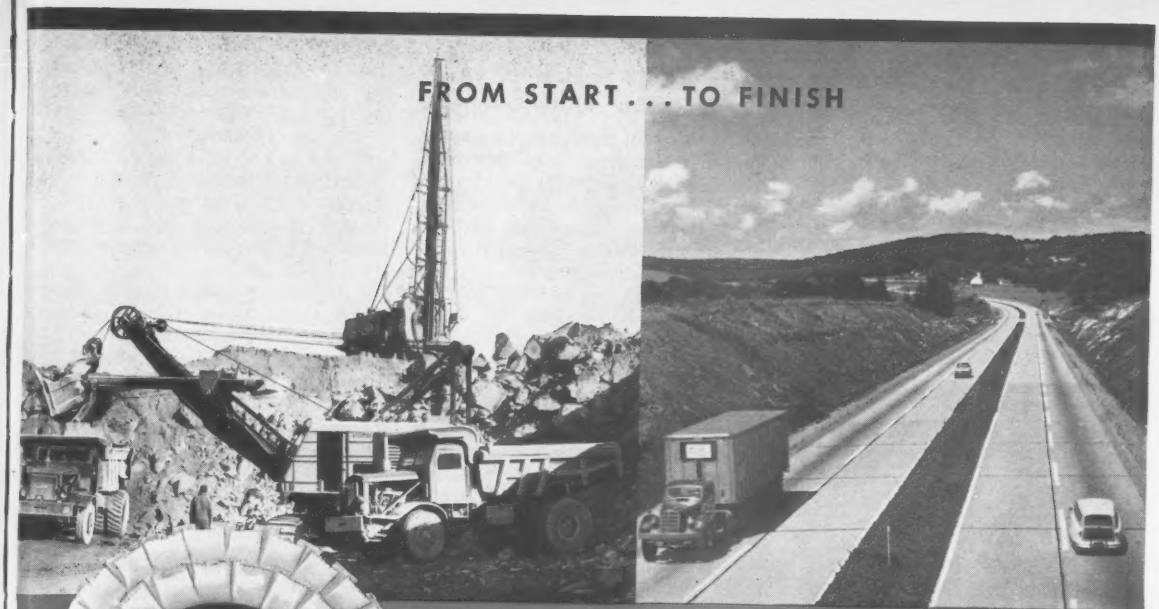
Additional information developed at the clinic is to be added as a supplement to the 90-page book, titled "Hundreds of Ways to Save Money." The volume is available on request to all NAHB members.

New Drugs May Influence Mental Hospital Design

A California State Assembly interim committee on public health, reporting on a study of tranquilizing drugs, stated that the use of these drugs has already affected the architectural requirements of mental hospitals.

The calming effect of the new drugs has reduced the need for such security facilities as detention rooms and detention screens. At several hospitals the committee found there was no further need for heavy, indestructible furnishings but there was an increased need for more activity, recreational and occupational therapy rooms and more outpatient and day care facilities.

The committee felt that major building expenditures for mental hospital construction should be postponed until the drugs' effects on hospital requirements are further understood and evaluated.



Socony Mobil's new Contractor PM System and famous quality products help you

STAY AHEAD OF JOB SCHEDULES!

Contractor PM System Includes:

1. Record Folder—provides identifying data for each piece of equipment, holds equipment records.
2. Operator's Recommendation Chart—lists the correct lubrication recommendations for each piece of equipment.
3. Weekly Service & Inspection Report—an up-to-date record of mechanical condition of equipment, work to be done or completed.
4. Delivery Ticket—lists petroleum supplies delivered to equipment on the job.
5. "Squawk" Sheet—used by equipment operator to point out trouble spots that need attention.

Tough job ahead? You'll make it a whole lot easier when you use Socony Mobil's simplified Contractor PM System and these top-quality Mobil products:

Famous Delvac Oils—for all gasoline and automotive Diesel engines.

New Mobilube GX—multipurpose-type gear lubricant for enclosed gears—manually operated transmissions, transfer cases, final drives.

Versatile Mobilgrease MP—multipurpose-type chassis and wheel-bearing grease for all types of equipment.

These top-grade Mobil products plus the practical Contractors PM System are a part of Socony Mobil's Correct Lubrication Program which also includes:

Lubrication Engineering Service covering analysis, advice and use of Socony Mobil's outstanding technical know-how.

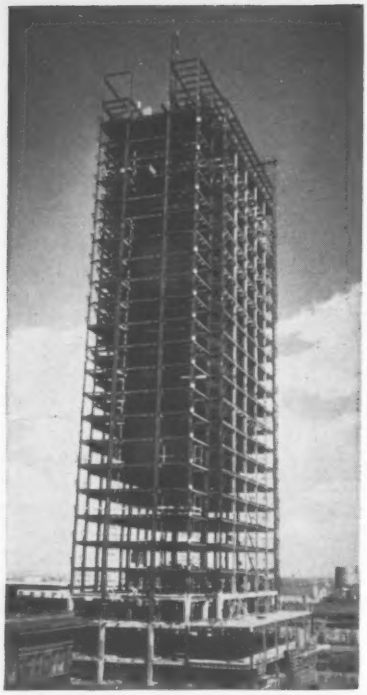
Mobil **SOCONY MOBIL**

Leader in lubrication for over 91 years

Correct Lubrication

A PROVED PROGRAM TO REDUCE EQUIPMENT MAINTENANCE COSTS

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION



Tallest Denver Building Will Have Roof Heliport

Besides being Denver's tallest building, the 29 story Murchison Tower, now under construction, will have the city's first rooftop heliport. The landing space will be a 52 x 80 ft asphalt-surface area, 365 ft above the street.

The overall cost of the project will be over $15 million when the building is completed in mid-1958.

The four-story base of the building is L-shaped, 166 x 400 ft. The 153 x 82 ft rectangular tower section rests on the outside corner of the L. The portion of the base behind the tower will be used as a garage. Spiral ramps will provide access for the 500 cars that will be accommodated in the 247 x 125 ft, four-story garage section.

Cellular metal decks topped with lightweight concrete will make up the floors of the bolted steel-framed structure. The facade for the base and narrow faces of the tower will be composed of precast concrete panels with exposed-aggregate finish. The window sides of the tower will be faced in metal and glass. The spandrel panels will be of insulated blue-anodized aluminum.

Raymond Harry Ervin & Associates are the architects for the building. Mead & Mount Construction Co. is the general contractor. Structural engineers are Phillips, Carter & Osborn. Marshall & Johnson are the mechanical engineers and Swanson & Rink, Inc., are the electrical engineers. All are Denver firms.

Port Proposal

Port of Seattle is ready to create industrial land

The first steps should be taken next month in the creation of the Duwamish Development District for the port of Seattle. It will require an investment of $15 million during the next 10 years. Roughly half of the total funds will go into construction.

A public meeting will be held in mid-June 20, when projected plans will be discussed. At the same time, consulting engineers will be retained to design a bascule bridge across the new channel of the Duwamish River, south of Seattle.

The project involves straightening the Duwamish and Green Rivers to obtain industrial tracts in a 4.5 mi stretch of the Duwamish Valley. Most of the work must await completion of the new bridge, scheduled for 1960. An estimated 200 acres of land will have been reclaimed by 1963, according to present plans, and 550 acres by 1966.

The project is made possible by construction of Eagle Gorge flood control dam on the Green River by the Corps of Engineers, slated for completion in 1960. The dam, for which preliminary work is now under way, will regulate the level of the two rivers. Flooding has kept industry away from the banks.

Plans call for the winding rivers to be compressed into a straight channel, with dredging to be done by the Corps of Engineers. Service roads, railroads and utilities contracts will be awarded by the port of Seattle.

By the end of 1963, the port expects to have spent the $10.8 million it will acquire from its authorized 6 year imposition of a $2 million taxing measure approved by the recent session of the state legislature.

Estimates are that another $5 million will be required to complete the project as far as Renton Junction (which is just outside of Seattle) by the end of 1966.

Additional industrial acreage, up 22,000, then may be obtained south of Renton at a relatively small cost.

Ferry Service Proposed to Connect Delaware-N. J.

A proposal that the states of Delaware and New Jersey create a joint ferry commission, with authority to issue up to $12 million in revenue bonds, has been made.

The bonds would finance a new ferry system between Lewes, Del. and Cape May, N. J.

Such a ferry service has long been promoted by business interests in both states with the hope that it would aid in development of the area.

TWA Starts Jet Hangar in San Francisco

Construction has started at San Francisco's International Airport on a Trans World Airlines hangar large enough to house two of the huge jet transports to be put in service next year.

The hangar will be 320 ft long and 44 ft high. Cantilevered trusses 32 ft c-c and 135 ft long will support the roof over the maintenance section. A concrete shear wall will separate the plane area from three stories of office and crew rooms at the front. The building will be 43,000 sq ft in area.

A parking area in front of the hangar will accommodate 10 planes. Service spots on the parking apron will be equipped with fuel, compressed-air and water lines.

The steel-framed hangar will be enclosed with precast concrete walls and faced with colored asbestos cement siding and metal curtain walls.

The project will cover 16½ acres and cost $2 million. It is scheduled to be completed in December.

H. K. Ferguson Co. is the designer and Barrett Construction Co. is the general contractor.

Seattle's Second Source

Land swap clears way for new water supply

Last obstacle to the development of a second source of water supply for Seattle, Wash., was removed when the Washington Board of Natural Resources agreed to an exchange of land required for the project.

The city needs approximately 1900 acres of state-owned land which would be flooded by the reservoir behind a dam on the Tolt River and sought to buy it. The board refused to sell, but agreed to trade it for land of equal value owned by the city. J. Ray Heath, Seattle water superintendent, termed the offer "very agreeable" and predicted it would be approved by the city council.

In presenting his case to the state board, Mr. Heath said Seattle has a daily water supply capacity of 200 million gal from the Cedar River whereas the city's population used 232 million gal daily last summer. The city was able to supply the extra demand from storage last summer, but must develop added supply, Heath said.

The state first had sought simply to lease to the city land required for the watershed. The city objected to this arrangement, contending the lands might be opened to hunting and fishing and thus provide a sanitary problem.

The city expects to call bids shortly for a dam estimated to cost $7 million and requiring two years for construction.

South Carolina Port Plan Beginning to Take Shape

Architects and engineers have been named for the South Carolina Ports Authority's expansion program (ENR Feb. 21, p. 289). Palmer & Baker, Inc., consulting engineers of Mobile, in association with Lockwood Green Engineers, Inc., of Spartanburg, S. C., will handle the $21 million project. The two firms will jointly plan and supervise the expansion program at all three of the state's seaports: Charleston, Port Royal and Georgetown.

Cotesworth P. Means, Ports Authority chairman, said that priority would be given construction of a new docking unit at Port Royal to support dredging work being done by the federal government. Mr. Means said construction would start as soon as plans and specifications are ready and bonds issued under the $21 million development program. The architects and engineers also will begin work on a master plan for the port of Charleston and for a berth unit at Georgetown.

The state port program was fostered by a special State Port Planning Committee and the Ports Authority to meet heavily increasing maritime traffic expected to flow through Charleston and other South Carolina ports in the next five years. Charleston's imports, for instance, are expected to climb 130% over the level of imports in 1955. Exports are expected to increase 87%.

"By 1961," Mr. Means said, "the level of our foreign trade, according to cargo potential surveys made during the study of the needs of our ports, is fully expected to be double that of the 1955 level when the Authority's facilities in Charleston were operating at peak capacity as they are today."

Property Owners Get Pay For Loss of Access

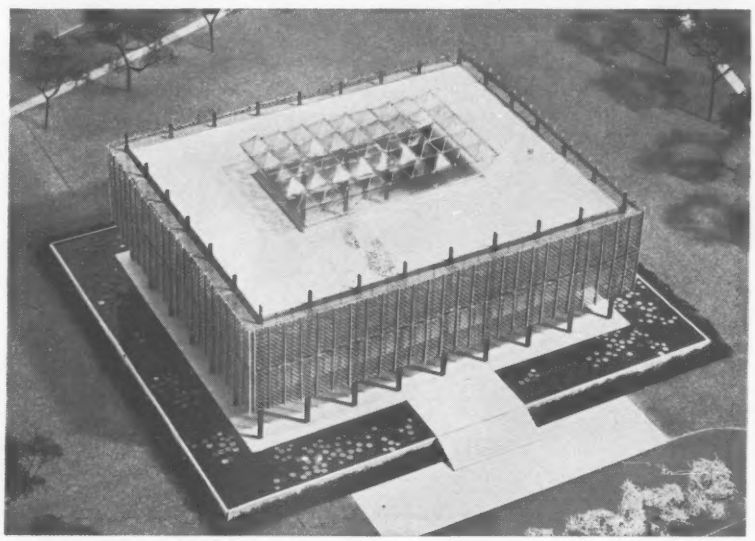
The Roads Committee of the North Carolina State Legislature has approved a substitute controlled-access measure to nail down powers of the State Highway Commission to acquire rights of way for and construct limited access superhighways.

The measure seeks to compensate property owners for denying them the right of access to a highway across their property. It states that "the denial of such rights of access shall be considered in determining general damages suffered" by the property owner when his land is taken for a new limited access road.

A further provision says that when an existing highway is designated as limited access, property owners "shall be entitled to compensation for the taking of or injury to their easements of access."

A. H. Graham, chairman of the State Highway Commission, commented that necessary rights to condemn property for limited access already exist, but that the bill was designed to "preserve the rights of the people." He added that the measure would save the state money in litigation by spelling out these rights.

The North Carolina Supreme Court has already ruled that the Highway Commission has the right to condemn property for limited access roads.



Aluminum Mesh to Face Office Building

A false front of aluminum mesh will enclose a new building to be constructed near Detroit to house the regional sales offices of the Reynolds Metals Co.

Designed by Minoru Yamasaki, Detroit architect, the building will be a three-story structure of aluminum and glass, with the ground floor mostly unenclosed by walls. It will be surrounded on all sides by a rectangular moat.

The terrazzo first floor will be devoted to indoor and outdoor displays of aluminum products. Offices will be located on the second and third floors.

The gold-anodized aluminum mesh will act as a sun screen for the upper floors. Consisting of an interlocking system of aluminum rings 10½ in. in diameter, the screen will be set forward 5 ft from the walls. Catwalks in the space between will serve as permanent platforms for window washing.

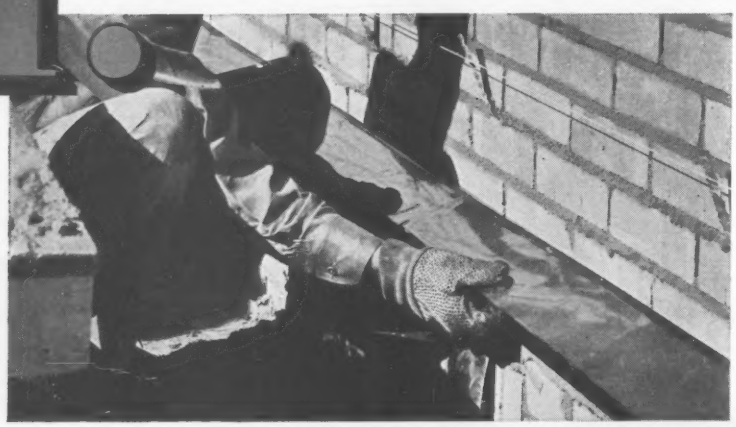
In the center of the building will be an open well, from first floor to roof, topped with a skylight divided into 45 aluminum and glass pyramids.

The building, including the sun screens, will be 135 ft long, 105 ft wide and 50 ft high. Construction will start next month.

Fabulous Gulfgate

Owner: THEODORE W. BERENSON AND ASSOCIATES, Boston, Mass.; Architects-Engineers: JOHN GRAHAM AND COMPANY, Seattle and New York; Associate Architects: IRVING R. KLEIN AND ASSOCIATES, Houston; Contractors-Engineers: FARNSWORTH & CHAMBERS CO., INC., Houston; Sheet Metal & Roofing Contractor: LYDICK ROOFING COMPANY OF HOUSTON, Houston; Revere Distributor: MONCRIEF-LENOIR MANUFACTURING COMPANY, Houston.

1



HERE YOU SEE workman putting the Revere-Keystone standard 4" flat copper receiver with ¼" hook dam in place preparatory to putting masonry in place. Revere-Keystone 2-Piece Cap Flashing also comes in combination receiver and Thru-Wall Flashing, with receiver furnished in 49" lengths (48" layup), with 1" overlap in a locking tongue dam to assure proper alignment. (See diagram on next page.)

2

MASONRY being put in place over the Revere-Keystone 2-Piece Cap Flashing. In this way masons and roofers can work without interference and without damaging cap which is snapped into place after work is completed.

Shopping Center

takes 3 fast steps to a tight-as-a-drum Flashing Installation... uses

REVERE-KEYSTONE*

EASY-TO-PLACE 2-PIECE CAP FLASHING

This Shopping Center, located in Houston, Texas is the largest regional Shopping Center in the South, and includes famed Joske's and Sakowitz Department Stores. The Center itself, including buildings, truck tunnels and malls covers about 840,000 square feet, with the entire plot covering 2,580,000 sq. ft. which has in excess of 5,000 prime car parking spaces. It represents a $32,000,000 investment and was designed by JOHN GRAHAM & Co., of Seattle and New York.

Although there are 15,000 lbs. of Revere Sheet Copper and 8,600 ft. of Revere Reglet Flashing on this job the item of greatest interest is the 1,000 ft. of Revere-Keystone 2-Piece Cap Flashing, the flashing system that has created quite a stir with architects, sheet metal contractors and engineers.

HERE ARE SOME OF THE REASONS WHY—

FREE WALL—It provides the roofer with an unobstructed wall face for the placement of the base flashing. Receiver is laid in during construction of wall, while the insert is snapped in only after all roof and base flashing work is finished.

STRAIGHT CLEAN LINE, PERMANENT GOOD LOOKS—Factory-bent to precise dimensions. This, with the one-inch locking tongue, assures alignment of receiver slots, uniform appearance.

PERFECT WEATHER-SEAL—Factory-formed angles on the receiver and insert cause latter to hug the base flashing, weather-seal effectively. Water cannot blow up behind flashing.

NON-LEAKING DAMLOCK — Requires no soldering except for special conditions. The interlocking copper-to-copper overlap creates a dam which prevents longitudinal travel of water and drains seepage to the face of the wall.

VERTICAL RECEIVER SLOT ON WALL FACE—Position of vertical receiver slot on face of wall eliminates possibility of the receiver slot being crushed shut by weight of masonry.

CAN BE DISASSEMBLED—Insert can be removed with a simple tool and used again, with no loss of neatness or snugness, when the built-up base flashing or roofing have to be repaired.

Find out about this newest method of flashing neatly, quickly, safely, positively. Send for descriptive literature today! Write Advertising Department.

FREE! For group showing—Instructive 16 mm motion picture in sound and color—"SHEET METAL IN BUILDING CONSTRUCTION." A "must" for every Architect, Building Owner, Spec. Writer, Sheet Metal Contractor and Mechanic. Write Revere Advertising Department.

*Patent No. 2,641,203 Other Pats. Pending

REVERE COPPER AND BRASS INCORPORATED

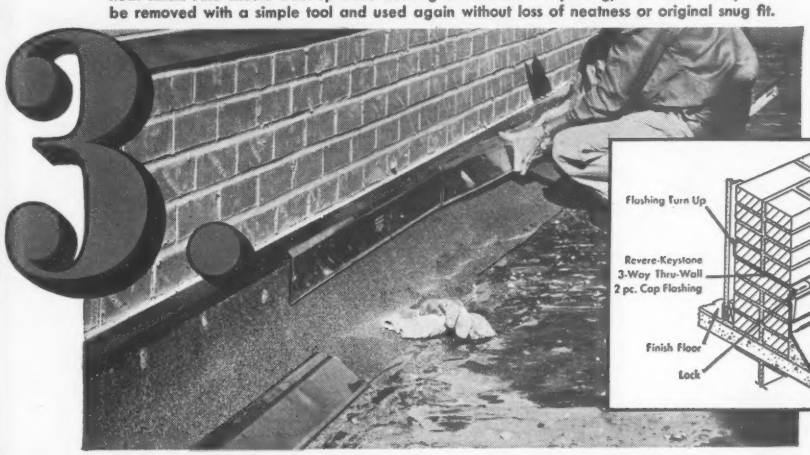
Founded by Paul Revere in 1801

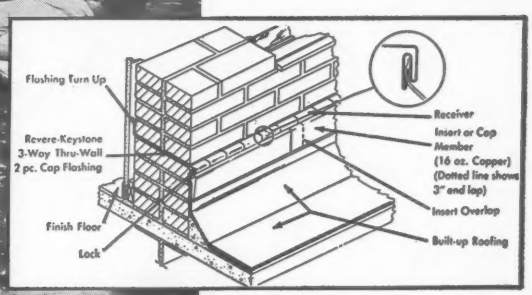
230 Park Avenue, New York 17, New York

Mills: Rome, N.Y.; Baltimore, Md.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Brooklyn, N.Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities, Distributors Everywhere.

COPPER * BRASS * 18 01 * REVERE * ALUMINUM

SNAPPING CAP MEMBER INTO PLACE to form a perfect weather seal gives the job a nice, neat finish. And should built-up base flashing or roof need repairing, the insert or cap can be removed with a simple tool and used again without loss of neatness or original snug fit.





Black & Veatch's new office building is of their own design to meet present needs and to fit a steady growth pattern

Consultants Build a New Home o

When the consulting engineering firm of Black & Veatch, Kansas City, Mo., was young, some forty years ago, it occupied a small rented suite in a downtown office building. Early this year, it moved into an entire new office building of its own, not downtown, but sixty blocks south of its first location, in the heart of a fine residential district. Most employees live within a ten minute drive, and some are close enough to walk.

To have an office building designed by itself for its own occupancy is most unusual for a consulting engineering firm, and to have it located in a residential area of a large city is equally rare. It is worthwhile, therefore, to know what kind of a building a consulting firm would build for itself, what motivated the decision to build, and what manner of firm would take such a forward looking step.

• **Growth based on service**—Black & Veatch, as a firm and as a group of associated individual engineers, is dedicated to the practice of engineering as a profession, with all that that implies with respect to service to clients, development of new business according to the highest professional standards and active participation in professional and public affairs. This was the type of conservative approach adopted when the firm was organized in 1915 with 25 employees, and it has been consistently maintained over the years as steady growth has pushed the employee total above 500.

A part of this growth has resulted from constantly increasing demands for service from old clients as they have undergone growth, and a part from new clients attracted to the firm by its past accomplishments and dependability. Thus the growth pattern has been geared to the demand, but with one important exception—growth has, several times, been postponed until the capabilities of the organization could handle it. Contrariwise, personnel have been kept in the organization regardless of the work load, and special effort has always been made to keep the work load sufficient to warrant full employment even in the depression days of the Thirties.

This kind of an approach to the business of consulting engineering and this kind of a philosophy must, of course, stem from the head of the firm, in this case N. T. Veatch, the managing partner since the death of E. B. Black in 1949. Tom Veatch has frequently said that each job, big or little, must be regarded as a challenging trust. "Since clients entrust a consulting firm with large sums of money, often belonging to other people," says Mr. Veatch, "these sums must be expended in a way to bring credit to both the client and the engineer."

Mr. Veatch has also practiced his philosophy of service where the profession and the public were involved. Always active in the American Water Works Association, he served as its president in 1947-1948. (In like manner, it should be noted that Mr. Black served as president of the Ameri-

LIGHTING PROVIDED is a combination of fluorescent ceiling units and individual desk lamps, each furnishing 40 ft candles.

EFFICIENT DRAFTING ROOM utilizes book cases between tables to increase work surface.

SECRETARIES occupy center of administrative department, with offices for each of the principal engineers around the walls.

ONE REASON FOR MOVING to an outlying site was the necessity to provide parking space for 200 employees' cars.

Their Own

can Society of Civil Engineers in 1942.) In public life, too, Tom Veatch has taken part in a large range of activities—among others, member of the Kansas City Planning Commission, of the first Federal Water Pollution Control Advisory Board and of the first non-partisan planning committee for the development of a filtered water supply for Kansas City. From 1928-1932 he was the Republican member of the two-member bipartisan engineering board, which supervised the design of the first concrete road system for Jackson County, Mo., under the direction of the then presiding judge of the county court, Harry S. Truman. Public service has also motivated Mr. Veatch to use a farm he has operated for many years a dozen miles from his alma mater, the University of Kansas, as a model of soil erosion practice, and to cooperate with the old Civilian Conservation Corps to develop a dam and a 200 acre recreational lake abutting his property.

• **Cities and utilities are clients**—The practice of the firm, which Tom Veatch heads, is generally limited to the major field of the utilities, public or private, associated with the development of cities—water supply, electric power, sewerage and gas systems, together with similar service to the national government in these and related defense fields. In the latter connection, starting in 1946 with the development of a water supply and other utilities for the Atomic Energy Commission at Los Alamos, New Mexico, Black & Veatch has been continuously engaged on classified work, much of it far removed from water supply, for the AEC, the Corps of Engineers, the Air Force, the Navy and other agencies of the Department of Defense both in the continental U. S. and at a number of foreign bases. This work has been, and will continue to be, carried on in a separate project office in Kansas City, where 80 to 100 engineers and technicians are kept busy.

In addition to design work, valuation and rate studies for utilities have always been a strong factor in the operations of the firm. Overall, considering all types of jobs, Black & Veatch has handled something over 2,800 engagements spread over the entire country, since it was organized in 1915.

• **Why move?**—It was this growth of the firm, coupled also with the growth of Kansas City, which caused Black & Veatch to decide to leave its downtown office location. The move to the new building, however, was not made in one step. The first shift came in 1935 to rented quarters in the Country Club Plaza District—the famous suburban shopping center which set the pattern for the many similar areas developed since throughout the United States. The firm's initial requirement here was for 4,600 sq ft of office space, but this gradually expanded until 23,000 sq ft was occupied in four different locations in the Plaza District.

This separation of offices, however, presented many obstacles to administration and efficient utilization of personnel. Moreover, with the phenomenal growth of the Plaza District, sufficient parking space for the employees' cars became a serious problem. Spurred by these disadvantages, the decision was taken to overcome them by finding a location with sufficient land to provide off-street parking for all employees, within reasonable proximity to employees' homes and convenient to a business and shopping district. These requirements could not be met in any existing office facilities, so the further decision was made to build a new building tailored to the firm's functional needs.

The site selected is about 7 miles south of downtown Kansas City, or 2 miles farther than the Plaza District. Although it is adjacent to the high type Indian Hills residential section, a nearby business section made it possible to obtain land zoned for commercial use.

• **Simple and functional**—The building designed for this site was made as simple and functional as possible, but with due regard for an outside appearance that would fit its surroundings, and an inside treatment that would afford pleasant working conditions. Of two stories and a basement, with provision for adding a third story, the building has plan dimensions of 74 x 170 ft. providing 37,500 sq ft of space and accommodations for 350 employees. The frame is of reinforced concrete, with all columns and walls founded on drilled-in concrete piers carried to rock. Walls and permanent partitions are of expanded shale concrete block laid in stacked bond with tooled joints. The exterior walls are faced with sand finished brick, relieved by exposed concrete columns and canopies.

All windows and columns, as well as lighting, heating and air conditioning outlets were laid out in modules to allow for future partition changes. Window sash and sills, exterior door and sidelight frames and gravel stops are all of aluminum. Washrooms on each floor have structural glazed tile walls, ceramic floor coverings and suspended plaster ceilings. All plumbing fixtures are of the wall-hung type. Asphalt tile floor coverings and suspended acoustical tile ceilings are provided in all office, drafting, corridor and recreational areas. Movable office partitions are of gypsum board on steel frames with birch doors.

Overhead lighting in all office and drafting areas is fluorescent, with fixtures located parallel to the building lines and designed for a minimum maintained intensity of 40 foot candles.

Considerable study was given to the question of providing sufficient overhead lighting to eliminate the need for individual desk lamps. But after considering such factors as glare, shadow effect and initial and operating costs, it was decided to base the design on a combination of overhead and individual desk lamp lighting. This combination provides a minimum lighting intensity of 80 foot candles on the top of desks and drafting tables. Metal raceways are

LOCATED IN A RESIDENTIAL SECTION of Kansas City, this new building was designed exclusively for Black & Veatch's consulting engineering operations.

Do You Have This PIPE PROTECTION PROBLEM?

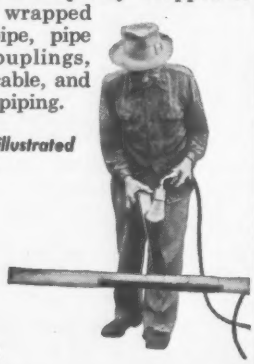
Underground piping must be protected against destructive forces of corrosive soils and electrolytic conditions. Normally, coal tar coating as called for in AWWA specifications C-203 and C-204 would be hot-applied at a coating mill. However, there are times when the volume of pipe involved or the distance of a coating mill make this impractical from a time and cost standpoint.

You'll find the ANSWER with TAPECOAT® . . . the Quality Coal Tar Coating in Tape Form

TAPECOAT is the widely-accepted alternate material that is equivalent to mill-applied hot coal tar protection. With this easy-to-use material, protection can be applied in the field by your own men, because technical know-how, kettles and special crews are not required. You save time and money while providing the long-life protection called for.

TAPECOAT is easily applied, using a torch to soften or bleed the pitch which gives both bond and protection. Available in widths from 2" to 24", it is spirally wrapped or cigarette wrapped around pipe, pipe joints, couplings, conduit, cable, and insulated piping.

Write for illustrated brochure.



The TAPECOAT® Company

Originators of Coal Tar Coating in Tape Form

1551 Lyons Street
Evanston, Illinois

. . . Consultant's own office building

IN HIS OFFICE in the new building Tom Veatch (with book) holds a conference with three of his associates (l. to r.) R. E. Lawrence, T. B. Robinson and E. L. Filby.

provided in all floors on approximately 6 ft centers for electrical and communication outlets.

The air conditioning and heating system is of the high velocity forced-air type, with six separate zones independently controlled by room thermostats. The design provides for 100 per cent fresh air make-up and 100 tons of refrigeration for summer cooling.

Counters, with shelving below, are provided between each row of desks or drafting tables so that each individual has a place to spread out plans and for personal storage. The desks and drafting tables are staggered to avoid interference. Of the several types of drafting room layouts studied, this one appeared to give the maximum workability for the minimum space, and requires approximately 73 sq ft per employee.

• **Disposition of forces**—Within this building, the firm's organizational forces are provided with quarters fitted to their needs for most efficient operation. The main entrance to the building is in the center of its longest dimension. Here the receptionist is located in a lobby, off of which stairs lead to the upper and lower floors, and a corridor runs directly through the building to a rear entrance, giving access to a 200 car parking area.

On the ground level, to the left or west of the main entrance is the administrative area. This consists of the secretarial department in the center, with private offices around the walls for the firm's principal engineers, which it calls project sponsors since they handle all client contacts. The administrative area also includes a large conference room for staff and client meetings.

To the right of the main entrance, on the ground level, is the civil engineering department, designated the civil sanitary department since it handles water supply, treatment and distribution, sewage and waste disposal, gas transmission and distribution, roads and streets, storm drainage and miscellaneous civil engineering work. The civil sanitary engineering department also occupies the front half of that part of the basement directly below its ground floor quarters.

The entire upper level of the building is devoted to work in connection with steam power plant and electrical facility design. The front of the east wing houses the civil structural department on power plant work while the mechanical engineering department is located in the rear half. The west wing of this second floor is occupied by the electrical engineering department.

In the basement, in addition to the portion assigned to the civil sanitary department, is located the department devoted to rate studies and appraisal work. Also, in the basement, are the general office library, the facilities for mimeographing, multigraphing, printing of plans and assembling of specifications and reports, a recreation room and the boiler and air conditioning equipment room. Allied to the library, but not actually a part of it, is a large room used for the storing of information on all previous projects handled by the firm. All projects are card indexed for easy reference.

On each floor there is also a double conference room for the use of personnel in discussions with any interested persons. These conference rooms are provided with a flexible partition in the center, which may be closed to provide two smaller conference rooms. A private office for each department head is also located adjacent to his department.

The Winn-Senter Construction Co., Kansas City, Mo., was the general contractor for the construction of the building. Design and supervision were by Black & Veatch.

DRAGLINE ROPE-DERRICK R
SLINGS-CLAMSHELL ROPE-S
SCRAPER ROPE-BOOM GUYS
CLAMSHE RANE RO
GUYS-SI DOZER
WAY EXC -DRAG
DERRICK APER RO
CABLE WAY EXCAVATOR ROPE
OPE-SLINGS
CRANE ROPE
SHOVEL ROPE
BOOM GUYS
DOZER ROPE

WHYTE STRAND

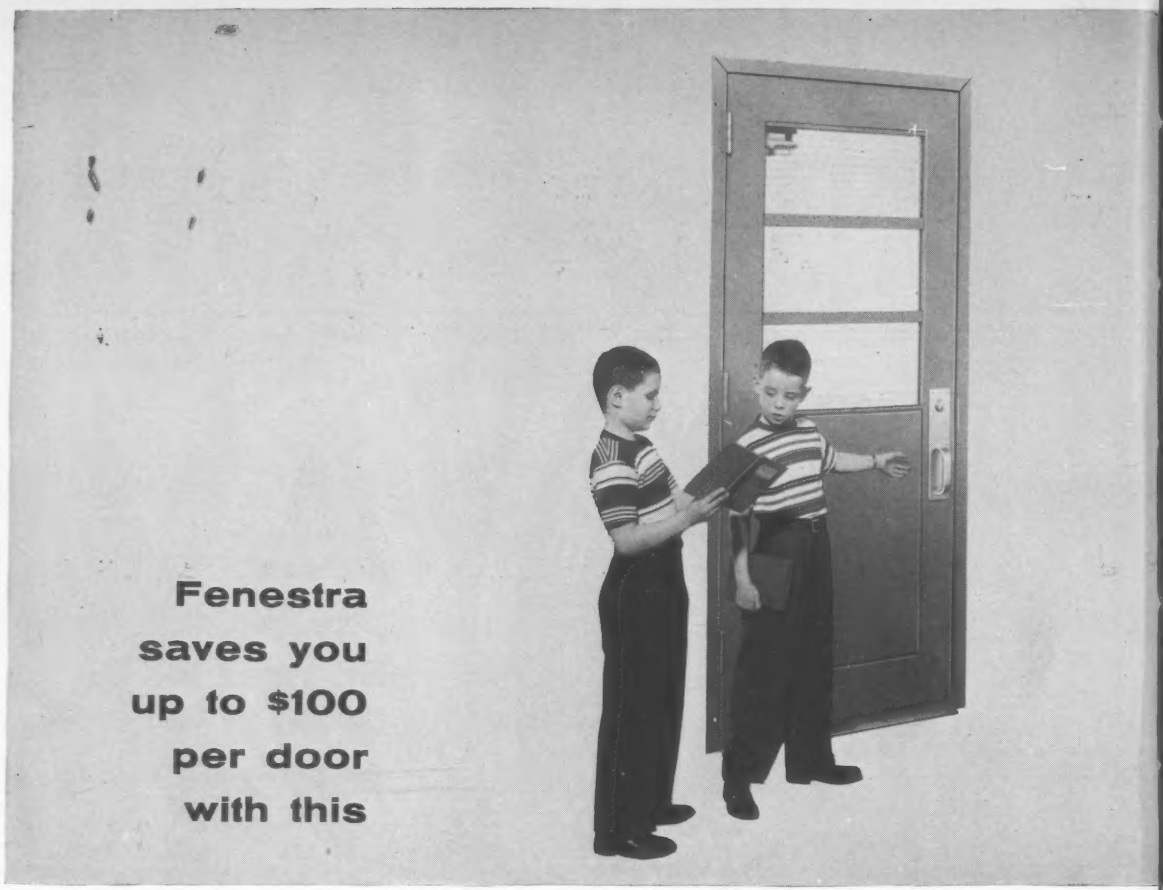
wire ropes are made to meet the needs of today's high output machines. There is a WHYTE STRAND wire rope in the correct size and construction for each use on all your machines. These Macwhyte ropes are PREformed for maximum flexibility, internally lubricated for super service, and stocked for immediate delivery.

Don't guess at the correct specification of wire rope for your machines. Ask for "Correct Wire Rope" Bulletin No. 5702.

MACWHYTE COMPANY
2906 Fourteenth Avenue, Kenosha, Wisconsin
Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope, and Wire Rope Assemblies. Special catalogs available.

MILL DEPOTS: New York 4, 35 Water St. • **Pittsburgh 19,** 704 Second Ave. • **Detroit 3,** 75 Oakman Blvd. **Chicago 6,** 228 S. Desplaines St. • **St. Paul 14,** 2356 Hampden Ave. • **Ft. Worth 1,** P.O. Box 605 • **Portland 9,** 1603 N.W. 14th Ave. • **Seattle 4,** 87 Holgate St. • **San Francisco 7,** 188 King St. • **Los Angeles 21,** 2035 Sacramento St.

5120-G



NEW CUSTOM DESIGNED S

Here's a door designed especially for school classrooms. It looks expensive, but it isn't. It's a stock door by Fenestra®—with an installed cost about $100 less per opening than you'd expect to pay.

What's outstanding about this door? First, the hardware. The new anodized aluminum pull-push plate makes it easy to open for even the smallest child. It's locked from the outside with a key. A thumb turn on the inside will open the door if a child should be locked in by mistake. An automatic door closer and inside kick plate are also included. Now, look at the glazing. Two panes of patterned glass with one pane of clear glass gives classroom privacy with a view window at eye level.

Architect Glen Drew, Poplar Bluff, Missouri, uses Fenestra Hollow Metal Door-Frame-Hardware Units for custom quality at stock door costs. O'Neal School, Poplar Bluff, Missouri, has 42 Fenestra Flush Doors. *Contractor:* George H. Gassman Construction Co., Poplar Bluff, Missouri.

ED SCHOOLROOM DOOR

The door itself is a Fenestra Hollow Metal Flush Door that can't warp, swell, stick or splinter. It always swings open smoothly and closes quietly. Thousands of these doors are in use in schools all over the country.

This classroom door costs you less to buy and install because Fenestra mass produces them on special jigs that save expensive labor. Then the doors, complete with frames and hardware, are delivered to your school ready to install. You don't have to cut, fit, mortise, drill or tap a Fenestra Door. It's factory machined for all hardware, either template or surface mounted. *One man with a screw driver can install it in minutes!*

Before you choose the doors for your next school, call your local Fenestra Representative—listed in the Yellow Pages—for complete information on this New Fenestra Classroom Door, or mail the coupon below.

Fenestra
INCORPORATED

HOLLOW METAL
DOOR-FRAME-
HARDWARE UNITS

Your Single Source of Supply for
DOORS • WINDOWS • BUILDING PANELS

Fenestra Incorporated
ER-5, 2286 East Grand Boulevard
Detroit 11, Michigan
Please send me complete information on Fenestra Hollow Metal Door-Frame-Hardware Units for schools.

NAME_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

Into the ground with ease, and for keeps

K&M ASBESTOS CEMENT PIPE

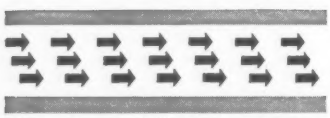
It's the modern pipe! Easy installation under any weather and ground conditions is just one of the advantages of K&M Asbestos-Cement Pipe. Other advantages: Permanently smooth non-tuberculating bore; non-corroding inner and outer surfaces; high resistance to electrolytic action; permanence of joint obtained quickly with exclusive K&M "Fluid-Tite"® Coupling.

K&M Pressure Pipe meets A.W.W.A., A.S.T.M., and U.S. Federal Specifications, and has Underwriters' Laboratories approval for all sizes (pipe and couplings) in Class 150.

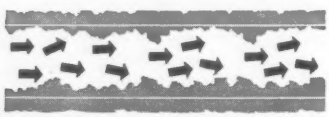
FOR GRAVITY SEWER SYSTEMS, K&M Sewer Pipe is the low-cost answer. "Fluid-Tite" Coupling makes permanent tight joint, prevents infiltration and root entrance.

FOR HOUSE-TO-SEWER CONNECTION, K&M Building Sewer Pipe and 2-step couplings round out the K&M family of asbestos-cement pipe.

Get the whole story on the modern pipe from the K&M distributor.



After many years, K&M Pipe hasn't tuberculated, bore remains unchanged, and full flow continues.



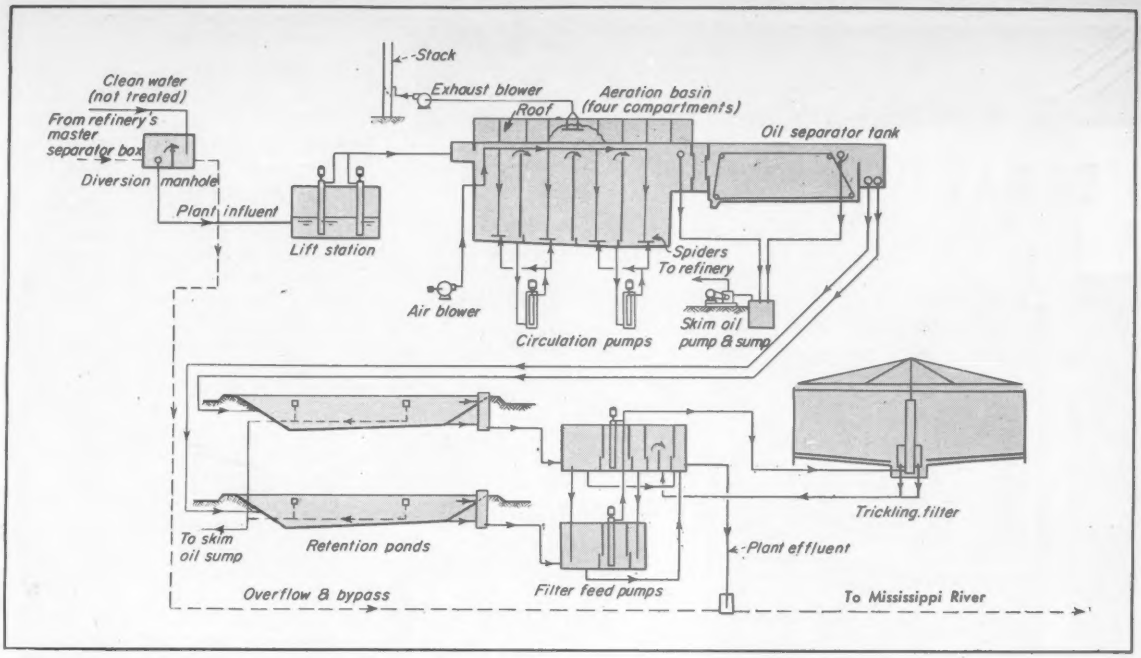
Old-fashioned pipe tuberculates over the years, requires higher pumping pressure, frequent cleaning.

K·M
BEST IN ASBESTOS

KEASBEY & MATTISON Company • Ambler, Pennsylvania

In Canada, it's ATLAS ASBESTOS CO., Ltd., 5600 Hochelaga St., Montreal, P.Q.

for "CENTURY" Pipe and "FLUID-TITE" Coupling



COMPLETE TREATMENT involves aeration, oil separation, retention ponds and trickling filter.

Oil Refinery Spares the Mississippi Its Wastes

Geo. S. Russell
and F. E. Wenger
Russell & Axon
Consulting Engineers
St. Louis, Mo.

Up to now, the industrial wastes of the Shell Oil Refinery at Wood River, Ill., have been discharging into the Mississippi River after only preliminary treatment at the refinery. To reduce the pollution load on the river, a $1.1 million complete-treatment plant is being built by the company on property adjoining the refinery.

The treatment facilities—to handle a design flow of 6 mgd—will include a lift station, a four-compartment aeration basin, oil separator, retention ponds and trickling filter. They will treat an effluent from the refinery master oil separator box that presents as treatment problems: phenols, sulfides, oils, suspended solids, mercaptans, chemical oxygen demand and threshold odor. The table below shows the expected state of the contaminants after different phases in the treatment process.

The effluent from the box now discharges by gravity through a 10,000 ft long, 36 in. wood-stave pipe to the Mississippi. The same pipeline will be used to carry treatment plant effluent, plus some 4.5 mgd clean (untreated) water that will by pass treatment.

• **At the master box**—Wastes go to the master oil separator box after pretreatment at the refinery. At the inlet to the box, pH will be kept between 7.0 and 9.0 by addition of caustic or spent alkylation acid. Control will be careful to prevent excessive stripping of H_2S from the aeration process into the atmosphere and to promote proper bacterial oxidation of phenols in the trickling filter.

Located at the edge of the refinery plot will be a lift station equipped with two vertical motor-driven pumps, each with a capacity of 6,000 gpm. During periods of low flow—below 6,000 gpm—recirculation will be practiced instead of intermittent operation.

• **Aeration basin**—This structure will be a reinforced concrete basin divided into four compartments by partitions which may be raised or lowered to force flow underneath or over the separations—or both. Retention time at the aeration phase is to be about 25 min at design flow.

An eductor system will be used for efficient air diffusion—air to be supplied by a motor-driven rotary blower and liquid to be pumped by two vertical motor-driven pumps. Piping will be arranged for one chest with 4 spiders in each of the four compartments.

The basin will be covered with removable metal panels, and a draft fan will exhaust air and water vapor from under the roof to a 75 ft high stack. A flotation type skimmer at the outlet end of the basin will remove froth and oil which will pass on into a skim oil sump. The aerated sewage will then pass through gated baffle openings to the oil separator.

(*Continued on page 40*)

State of Wastes After Different Phases of Treatment

	Master separator box	Aeration basin, Separator	Retention pond	Trickling filter
Phenols, ppm	40–50	35–45	35–45	10–15
Sulfides, ppm	30–50	15–20	15–20	0
Oils, ppm	200	100 or less	Less than 100	Less than 50
Suspended Solids, ppm	200	100	0–50	0–50
Mercaptans, ppm	5	Trace	Trace	Trace
Chemical Oxygen Demand	700	500	500	Approx. 200
Threshold Odor	50,000	5–25,000	5–25,000	5–15,000

SUBMERSIBLE

SEWAGE and SUMP PUMP

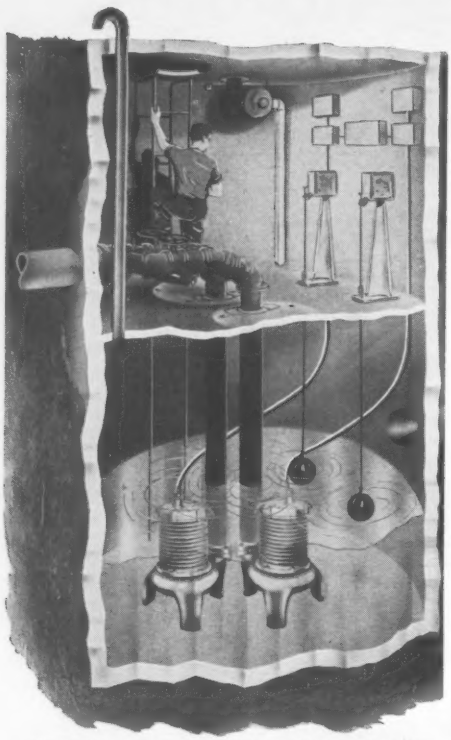


Illustration shows an economical installation which **does not require a pump house** to mar the landscape. This reduces the overall cost of the installation.

Engineered for

HEAVY DUTY DRAINAGE

DIFFICULT SEWAGE PUMPING

UNDERGROUND LIFT STATIONS

HIGHWAY UNDERPASS DRAINAGE

SUBMERGED OPERATION

Features

The new non-clog bladeless type impeller, the most efficient design for handling rags, stringy material and irregular solids with the liquids. 4" pumps will pass 2½" solids; 5" pumps will pass 4" solids.

The weil Submersible Non-Clog Sewage and Sump Pump is a pump designed to operate completely submerged under water. The only consideration where depth of setting is concerned is selection of the proper unit so that pump will have sufficient head to pump out of the sump. Pump can be installed and removed with low headroom above the wet pit. The submersible ejector is the same compact close coupled unit regardless of the depth of the pit.

Wide Range to Select From

The Submersible Ejector is available in discharges of 3", 4", 5" and 6" with heads to 60' and capacities to 2000 G.P.M.

Low Installation Cost

Simplicity in installation which requires only one piping connection and low maintenance due to the hermetically sealed motor assure economical installation and trouble-free operation.

Send for Bulletins SE-860 and SE-862.

See **weil** catalog in Sweet's 1957 and Domestic Eng. Cat. Dir. 1957.

weil PUMP COMPANY

1528 No. Fremont St. • **Chicago, Illinois**

. . . Oil Refinery

• **Oil separator**—The two-section oil separator is designed to hold a total volume of 84,000 gal for retention, at average flow, of 20 min. Surface area will be 1,600 sq ft with a surface loading of 3,800 gal per sq ft per day.

Conveyor sludge collectors of the continuous chain type with metal scrapers will remove sludge to the hoppers at the inlet end and, on the return run, will skim floating material which will be caught up by baffles at the downstream end of the tank and sent to the oil sump. Either section of the separator may be taken out of operation when necessary.

Sludge and skim oil are eventually sent back to the refinery for further processing.

• **Retention ponds**—From the separator, the flow will then be to two retention ponds, each with a capacity of 3 million gal for a retention time of 24 hours at average flow. The ponds also will provide a surge capacity for the plant.

The ponds are formed by earthen dikes sloped 1:1 and lined with asphaltic concrete. High water level will be about 2 ft below the wall tops.

Oil skimmer pans with adjustable weirs are to be installed at opposite ends of the ponds to further remove oils. Fluctuations in pH value and solids content will also be reduced at this stage.

• **Trickling filter**—Manually controlled pumps set in a reinforced concrete sump will feed the pond contents to the 140 ft dia, 10 ft deep filter bed made up of a media of 3 to 4 in blast furnace slag and underlain with vitrified clay drain tile. Provisions are being made for recirculation during periods of low flow or when there is a high sulfide content present.

The trickling filter is expected to remove any sulfides which might remain after the areation process and to lower the phenolic contaminants by biological oxidation.

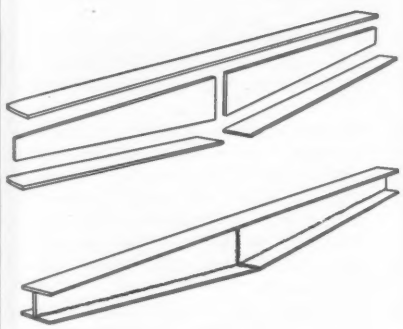
Effluent is then ready to enter the 36 in. wood-stave pipeline for discharge into the Mississippi—another step completed in the drive against stream pollution.

Russell & Axon, consulting engineers of St. Louis, Mo., were retained as consultants by Shell Oil Company to develop the plans and specifications in collaboration with the refinery engineers, who supplied test data and research work for design criteria. S. M. Wilson & Co. of Granite City is contractor for the job which is expected to be finished on schedule by early fall of this year.

Tapered beam construction *in warehouse designed and constructed by The Austin Company, Cleveland, Ohio.*

HOW TO DESIGN MORE ROOM

. . . with less steel, less cost



Tapered girder *is fabricated at low cost by welding. Components are simple webs, top and bottom flanges are cut from plate with little or no waste.*

MORE useable space per pound of steel, per dollar cost can be realized through proper use of tapered girder construction made practical by arc welding. Using tapered girders for framing roofs over large areas reduces the number of interior columns or eliminates them entirely depending on the span. Additional economy in construction is realized in reduced overall height of exterior walls. This results from less depth of web at girder ends.

Tapered girders are simply fabricated with two halves of web cut from wide plates, fillet welded to top and bottom flange plates using fast, downhand manual or automatic welding.

ARCHITECTS . . . ENGINEERS! Latest data on structural design is presented completely in new 466 page section on designing welded structures in 11th Edition Procedure Handbook of Arc Welding Design and Practice available at small cost. Write . . .

THE LINCOLN ELECTRIC COMPANY

Dept. 2325 • Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

Precasting 35 Acres of Roof Panels for W

9,200 concrete panels are mass produced in a casting yard set up at the building site near Sacramento, Calif.

ROOF PANELS are cast in rigid steel forms to keep the panels within a tolerance of ¼ in. overall dimensions. The panels are cast 60 at a time.

Taking advantage of previous experience with rigid-frame concrete structures, the Corps of Engineers is building a 35 acre all concrete warehouse for the Air Force at McClellan AFB near Sacramento, Cal. The one-story warehouse will be roofed with thin-shell precast panels supported on continuous reinforced concrete frames.

The warehouse is actually two buildings separated by a railroad spur. The buildings are identical in design and are divided into bays 200 ft long and 400 ft deep. One building is 1,800 x 400 ft and the other 2,000 x 400 ft. They will provide 1.5 million sq ft of warehousing for aircraft accessories and components.

Framing of the new warehouse is based on a standard design that has been used at other Air Force bases. The original design was done by L. P. Kooken Co., Baltimore, Md. This design was modified and adapted to the site by Tudor Engineering Co., San Francisco.

Investigation of the failures in warehouses of similar design at Wilkins AFB (ENR Jan. 12,1956,p.21) and at Robbins AFB (ENR Sept.27,1956,p. 28) led to a strengthening of the frames used in the new warehouse. The girders are reinforced at the top and bottom for the full length and have web reinforcement throughout. In critical areas in the top of the girders as many as six No. 11 steel bars were added. The number of bars in the bottom of the girder remain the same, but sizes were increased from No. 9 to No. 11. Girder strength was increased by 40%. Four additional bars were specified for the columns and sizes of all column steel was increased from No. 10 to No. 11.

• **Preparing the site**—The column footings were set on a layer of hardpan averaging 3 ft in depth. It underlay a mixture of sandy silt and clay extending to the surface.

In grading the site, 38,500 cu yd of unsuitable material had to be removed. A total of 81,000 cu yd of select aggregate fill then was supplied to prepare the subgrade for the buildings. The fill was rolled to a compaction density of 98%. Such a high rate of compaction was required because of the heavy loading the warehouse floor will sustain.

Size of the footings run from 4 ft square for the smaller columns to 12 ft 6 in. square for the largest footings. They are reinforced concrete spread footings, except for mushroom type caisson footings at firewalls.

As soon as the footings were in, the grade beams were cast and placed.

• **Concreting the floor slabs**—After the areas around the footings were backfilled and compacted, concrete for the 8 in. thick unreinforced floor slabs was placed in 25 ft lanes. Inserts were left in the slabs for temporary wall braces.

After the concrete was vibrated, a rotary screed was used to provide an even plane. It produced satisfactory results in one pass, the contractor claimed. The slabs were hand trowled to produce a smooth finished surface.

• **Forming the walls**—The floor slabs were used as casting surfaces for the exterior wall and firewall segments. The exterior and shear walls are 6 in. thick. The 8 in. thick firewall panels, 27 x 24 ft, were the heaviest of the wall slabs. They weighed 27 tons apiece. Two 30 ton cranes were used to hoist the wall slabs into place.

To tie the wall panels together, steel from adjacent units were looped and welded at the top, middle and bottom.

• **Frame erection**—Erection of the cast-in-place, continuous reinforced concrete frames began simultaneously with the casting of the wall panels. The girders are continuous in the 400 ft direction of the building, except for the expansion joint near the middle of the frame.

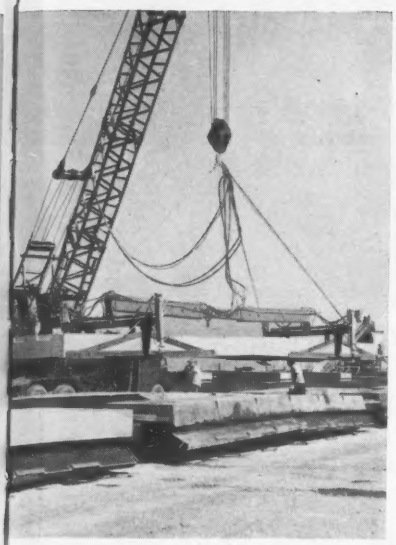
Curing time for the girders was 21 days, but the shoring was left in up to 28 days.

The shear and firewall columns were concreted after the wall panels had been erected. This tied the wall components together.

The 800 roof beams to brace the frames were precast. The contractor used nine roof beam forms and cast nine beams a day, stripping the forms after 18 hours.

• **Casting the roof panels**—Some 9,200 thin-shell precast roof panels are being used to roof the warehouse. The panels are made with an expanded-shale ag-

for Warehouse



SPECIAL CLAMP lifts the panels from the forms 48 hours after the mix was placed.

EXPANSION JOINT is the only break in the 400 ft continuous concrete frames, which were cast in place. The roof panels are laid on top of the frames.

gregate. Each panel is 33 ft 4 in. by 5 ft. They are 12 in. deep at the ribs, but the top slab is only 1¾ in. thick at the center.

The roof panels were cast in rigid steel molds to meet a tolerance of ¼ in. in overall dimensions. The forms were stripped after 48 hours and the panels sprayed with a membrane curing compound, then cured for 60 days. The panels were cast 60 at a time.

A 2 in. cover of perlite concrete was applied over the panels for insulation. This was topped with a 5-ply builtup roof.

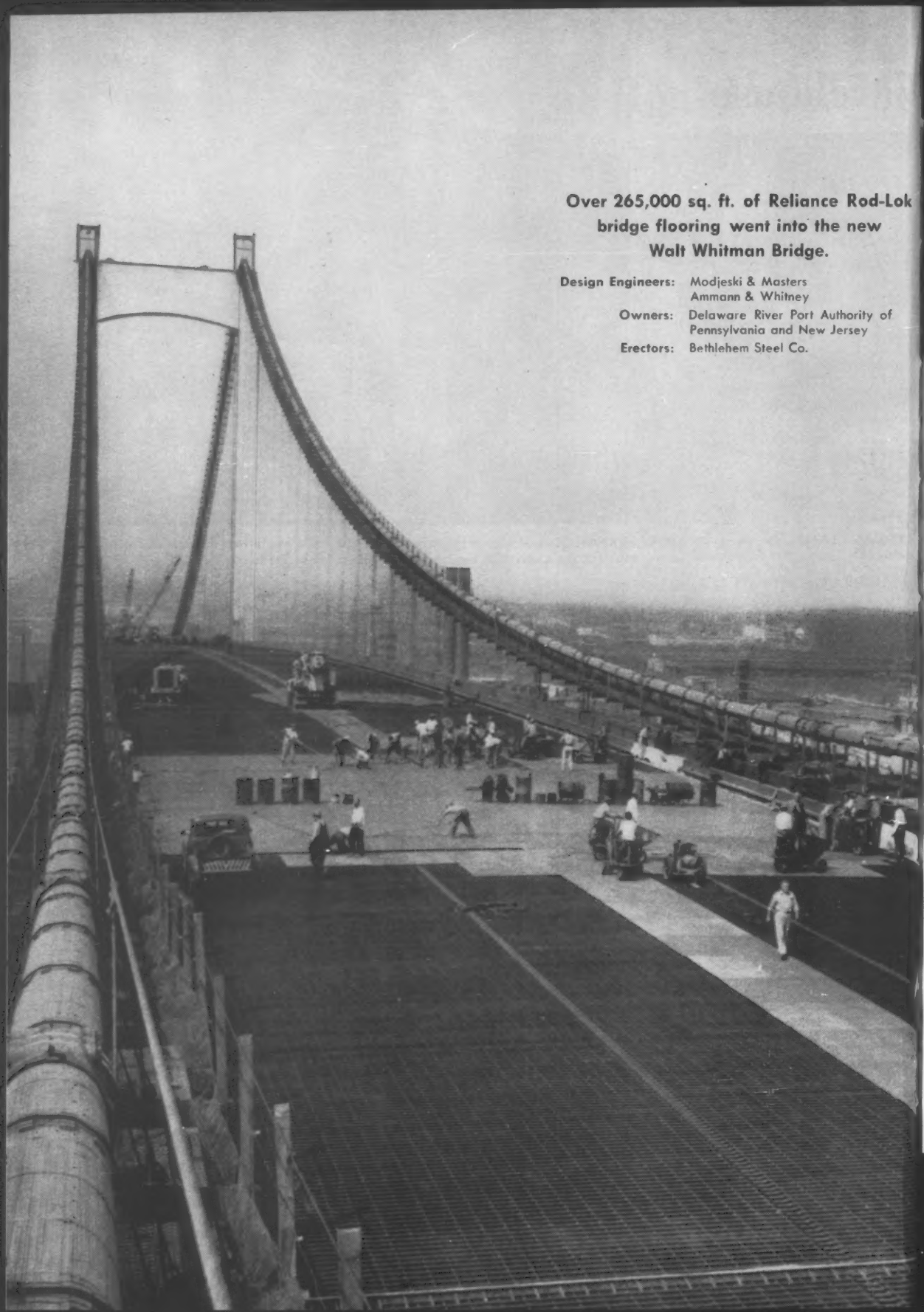
• **Some casting problems**—The summer temperature at McClellan AFB, ranging from 85F to 110F, at first caused some troubles with the concrete. Surface cracks appeared in the floor slabs placed during the morning. The aggregate, cooling down at night, experienced a rapid change in temperature under the morning sun. The aggregate that was placed in the slabs in the afternoon had warmed up before operations began and surface checking did not occur in these slabs. The trouble was eliminated by fog spraying the slabs immediately after trowling.

The roof beams had to be covered with wet burlap and an automatic fog spray used to keep the concrete damp enough to cure without cracking or checking. This same treatment was used for the precast roof panels.

The warehouse will cost an estimated $7,264,000 when it is completed in Jan., 1958. The contract was awarded to four Sacramento firms, Heller, Cambell, Erickson and Lawrence construction companies, who pooled their resources in a joint venture for the job.

TILTUP FIREWALLS are precast, with the floor slab as a casting surface. Firewall columns were concreted after steel from adjoining panels were looped and welded.

Design and construction contract responsibility is under the Corps of Engineers, South Pacific Division, headed by Brig. General William F. Cassidy. The contract for the project was let through the Sacramento District, Corps of Engineers, headed by Col. A. E. McCollam. Air Force Installations Engineers developed specifications and design criteria. The office of the Air Force Installations Representative, South Pacific Region, under Col. Edwin M. Eads, is responsible for monitoring the project. Lt. Col. Jack B. Marshall, Installations Engineer for McClellan AFB is performing Base supervision for the Air Force.

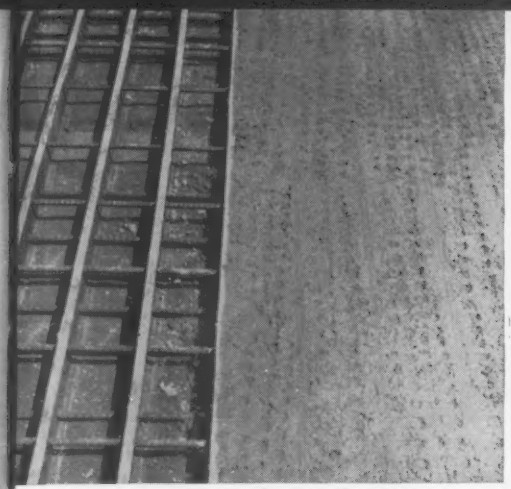


Over 265,000 sq. ft. of Reliance Rod-Lok bridge flooring went into the new Walt Whitman Bridge.

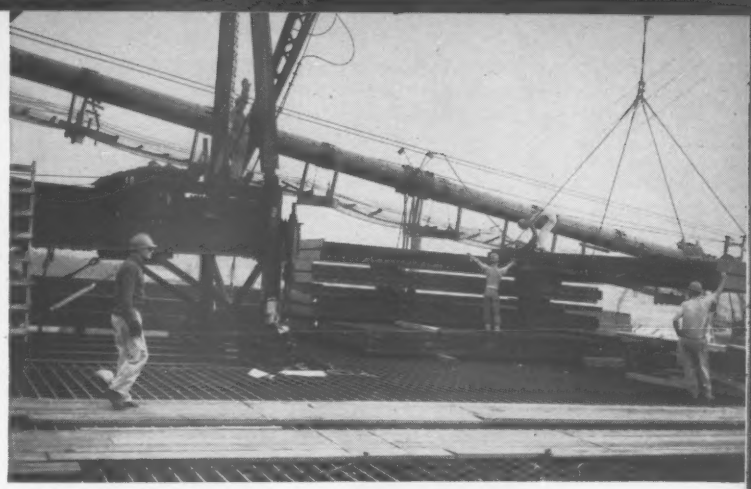
Design Engineers: Modjeski & Masters
Ammann & Whitney

Owners: Delaware River Port Authority of Pennsylvania and New Jersey

Erectors: Bethlehem Steel Co.



Built-in pans serve as forms for concrete, eliminating costly and hazardous form-building operation.



Using one boom, a welding crew could erect up to 9200 sq. ft. of flooring per day.

Reliance Rod-Lok Lightweight Deck Speeds Erection Time, Reduces Deadload and Lowers Final Cost of Walt Whitman Bridge

Over 265,000 sq. ft. of Reliance Rod-Lok flooring was used in the construction of the Walt Whitman bridge over the Delaware River connecting Glouster, N. J. and Philadelphia. The flooring used was the standard 5″ Rod-Lok with 7″ I-beam spacing, with slight modification in the form pan and in the cross-bar spacing. The extremely low weight of the flooring (16 lb./sq. ft.) saved many tons of steel in the superstructure, reducing both the initial cost of the bridge and the interest charges.

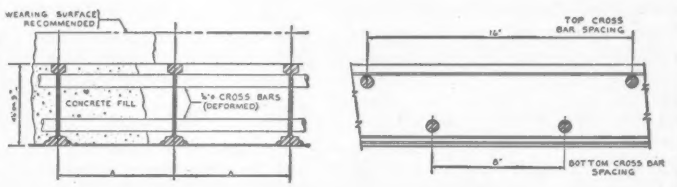
The Rod-Lok flooring includes built-in forms which eliminate costly and hazardous form-building operations. Months of construction time were saved, bringing in the toll revenues sooner. Large size of panels made laying fast—over 9200 sq. ft. per day could be erected by a crew of welders and a boom.

Rod-Lok is available in both 5″ and 4¼″ I-beam sizes with various beam spacings to meet any requirement. Safe span lengths are exceptionally long, as the table indicates. Time and labor saving concrete form pans are standard in all sizes.

PHYSICAL PROPERTIES

4¼″ I-BEAM ROD-LOK					5″ I-BEAM ROD-LOK					DESIGN UNITS
Spacing of 4¼″ I-Beam "A"	Weight per Sq. Ft. of Slab	Section Modulus per Ft. of Width		Recommended Safe Span	Spacing of 5″ I-Beam "A"	Weight per Sq. Ft. of Slab	Section Modulus per Ft. of Width		Recommended Safe Span	
		Concrete	Tension Steel				Concrete	Tension Steel		
6	66.0	57.2	3.46	8′-1¼″	7	75.8	77.0	4.72	10′-9″	f_c'=3000#/in² f_c=1200#/in² Max. f_s=18,000 #/in² n=ES/EC=10
7	64.6	52.0	2.96	6′-7½″	8	74.5	71.1	4.14	9′-3″	SPECS: 1953 A.A.S.H.O. H20-516 or H20
8	63.5	48.3	2.61	5′-4½″	9	73.9	66.9	3.73	8′-0″	
9	63.2	45.0	2.33	4′-6½″	10	73.1	63.1	3.40	7′-0″	

The values shown are effective spans; add ½ stringer flange width to obtain stringer spacing.



Reliance Steel Products Company

P. O. Box 510-A, McKeesport (Pittsburgh District), Pa.

Relgrit Abrasive Gratings and Treads • Lightweight Bridge Flooring
Steel, Stainless and Aluminum Grating • Steel Mill Equipment

In an area of shallow water and deep mud, the contractor for the substructure of the Connecticut Turnpike's West River Bridge found silt an expensive obstacle; before building the 1,100 ft structure, he had to install more than 1,800 ft of temporary trestle (right) and before he's finished, he will have removed thousands of yards of mud by a water jet-air lift (above) and clamshell.

Silt Swallows Up Half the Cost of $5Mi

One thing that can be said for certain about the Connecticut Turnpike Bridge now being built over the West River in New Haven, is that the biggest part of the job is the foundation. About half the cost of the $5 million composite girder and beam structure is in or below the footings.

The bridge itself, for which Mariani Construction Company has the general contract, will not be an overly imposing structure. Just over 1,100 ft long from abutment to abutment, the main structure will have 12 spans, the biggest of which is 110 ft long. The maximum clearance between the beams and high water in the 11 ft deep channel will be only 25 ft. Superstructure erection will be complicated somewhat by a 671 ft long exit ramp structure swinging on a compound curve over the edge of the river on a 270 ft radius from the main bridge to Kimberly Avenue below. But the big construction problems are in the foundations which have been subcontracted to C. W. Blakeslee & Sons, Inc.

The sixteen cofferdams needed for the footings are taking 147,000 lf (28 miles) of interlocking steel sheeting. The pile foundations being driven inside the dams will require 104,000 lf of 12 in. and 14 in. O.D. ⅜ in. wall pipe for cast in place piles, and 105,000 lf of 12 in. and 14 in. BP section H piles will be installed under the land structures.

Aside from the quantities involved, the apparently disproportionate cost of the foundations stems from one thing —mud. Two of the bridge's piers are readily accessible from the water, and the abutments, while on soft ground, are accessible to land rigs. The remaining 14 piers however have to be constructed in a veritable sea of mud averaging forty ft in depth—hence the problems.

In the first place, to get men, machines and materials to location, it was necessary to build expensive heavy duty trestles, which must also be removed at a later date.

In all, 1840 lf of temporary trestle had to be built. Much of this was needed for access to the piers of the structure ramp which were completely surrounded by mud. The trestle job required more than 1,100 wood piles each 60 to 65 ft long, and took more than 672,000 fbm of structural grade timber for caps, stringers and decking. Piles for the 24 ft wide access roadway were driven 4 ft on centers to a 30 ton bearing, and bents were spaced at 10 ft. Caps and stringers were 12 x 12's and the transverse deck planks and the longitudinal runway strips were 3 in. thick.

In the second place, the great depth of the mud presented a problem in obtaining lateral stability for the permanent piles, and made it necessary to drive them to a specified penetration rather than to a bearing value. When the substratum is fine sand and gravel as it is on the West River, this can be next to impossible.

Actually, Blakeslee is encountering all sorts of driving conditions while installing the permanent piles. For the first 30 ft., the piles generally fall in under their own weight—or at most the weight of the hammer. The last 50

$5 Million Bridge

ft often takes more than an hour of pounding with a hammer striking a blow of 19,280 ft lb or more. Actually, several types of pile hammers are being used, and the effectiveness of each varies from site to site with the heavier hammers often the least effective.

Before the piles could be driven, however, they had to be fabricated to meet job conditions—and this involved a considerable amount of cutting, fitting and welding. Since the piles, all of which are dependent on friction for support, were expected to run from 90 to 130 ft in length, economical point and splicing operations were a must.

The contractor was fortunate in having a large storage area available between the river and Kimberly Avenue on the east side of the job, and it was here that he set up his burning and welding operation. Pipe was available only in 20, 60 and 80 ft lengths, and the beams were ordered in 70 ft lengths. To reduce standby time for the driving crews, which would be occasioned by splicing during the pile driving, the contractor makes his pile sections as long as possible, does as much welding as he can while the materials are on the ground.

The bottom sections of the beams are driven without any welding, but the second sections are neatly stacked in rectangular piles to permit attachment of the splice plates with a minimum of handling.

For welding of the pipe, the contractor built an extremely handy jig. To a framework of pipe, channels are tacked with their backs up. On these channel backs are welded casters so positioned as to support the pipe on the wheels. The pipes are set on the casters and rotated by a variable speed power roller.

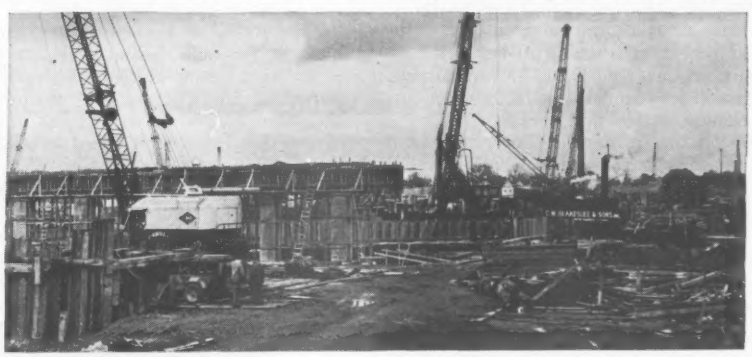
In addition to saving space, the method speeds the work by eliminating vertical and overhead welding. It also permits the use of highly efficient manual metal arc welding using iron powder electrodes. According to job superintendent Richard Soper, the iron powder electrodes alone increase his welding production by from 50 to 100% over that which was obtained by the use of standard electrodes.

In the installation of all the cofferdams, the contractor uses the same method. Individual dam areas are first excavated to a depth of about ten ft and temporary support piles are driven outside the perimeter. The complete internal framework of the dams is assembled above ground (or water—as the case may be). For the ten small cofferdams in the circular ramp, 12 x 12 timbers make up the struts and walers but in the large dams (116 x 21 ft) for the main structure, 14 in. 89 lb WF steel beams are welded together to make the internal frame. In all cases the frames are supported by the temporary timber piles which are blocked out so as to be clear of the sheeting.

After 60 ft sheets are driven to grade, the inside of the dams are cleaned out. As the holes deepen, the frames are lowered. To complete excavation, it is necessary, to get the muck clear of the frame only during the final 10 ft of excavation.

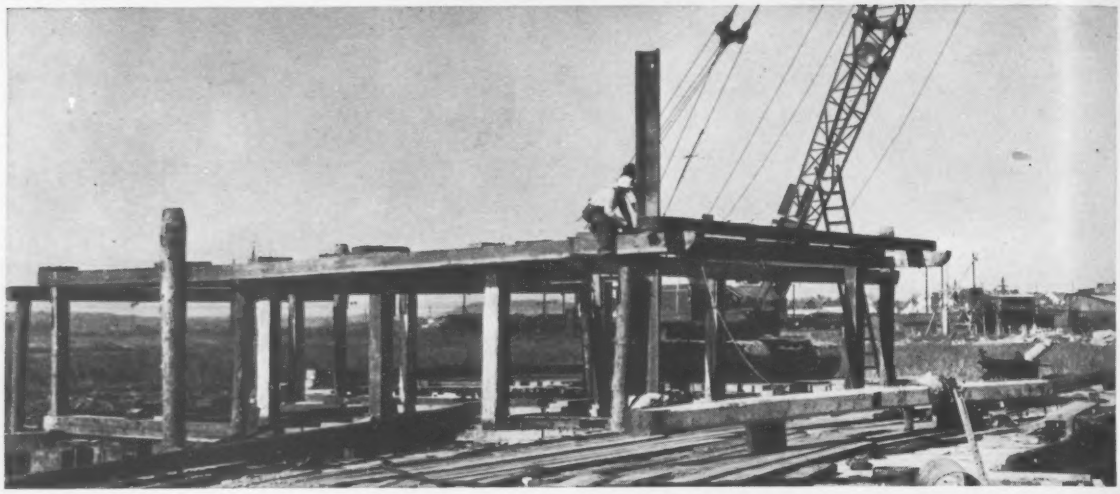
To assure that no excavation will be necessary after the driving of piles, the excavation was carried to −22.5 in all but the two channel piers where the dams are cleaned to −35 ft.

Proper cleaning of the inside of the sheets is one of the most important, and as any cofferdam man knows, most difficult operations in cofferdam work. Any mud left in the pockets of the sheets can cause a failure of the seal during the dewatering of the dam. One contractor on another of the turnpike bridges recently spent two weeks trying



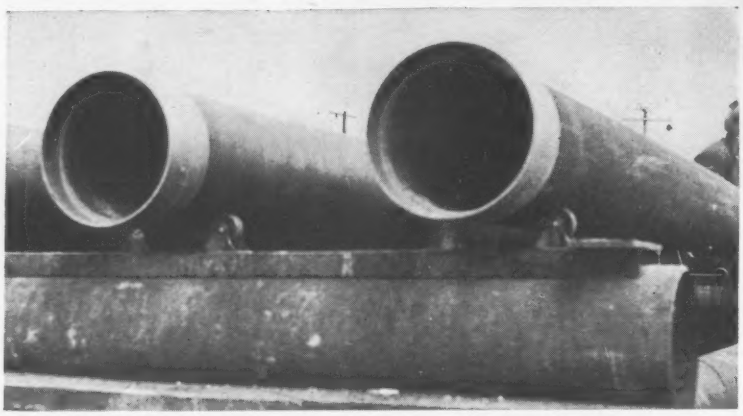
VARIETY OF OPERATIONS being carried on in close quarters is evidenced by photo above. At times Blakeslee had as many as 12 rigs on the 1,100 ft long job.

. . . Silt swallows up half the cost of $5 million bridge



COFFERDAM FRAMES erected above ground (and water) were supported by temporary piles while steel sheet piling was installed. Next to frame is part of temporary trestle which required 1,100 60 to 65 ft wood piles and 672,000 fbm of timber.

WATER JET-AIR LIFT combination looks complicated but is very efficient.



CASTER-EQUIPPED FRAME speeds welding by eliminating need for vertical and overhead work. Variable speed power roller turns pipes as welding progresses.

to correct a "blow" cause by carelessness in getting mud out of the pockets.

To expedite cleaning of the hard-to-reach areas of the dam, Blakeslee rigged up a combination jet and air lift. Three different sizes of lift pipe were used (8, 10, and 12 in.) but the principal was the same in each case. The lift pipes were set up in the shape of a giant inverted "L". The vertical pipe was long enough to throw the discharge outside the sheeting.

To the outside of the vertical pipe are welded a 2 in. water line and a 2 in. air line. The bottom of the water pipe is split into three smaller pipes which are set on three sides of the lift and so placed that their three streams will converge below the mouth of the lift. The air line is brought inside the larger pipe and directed upward by means of two elbows.

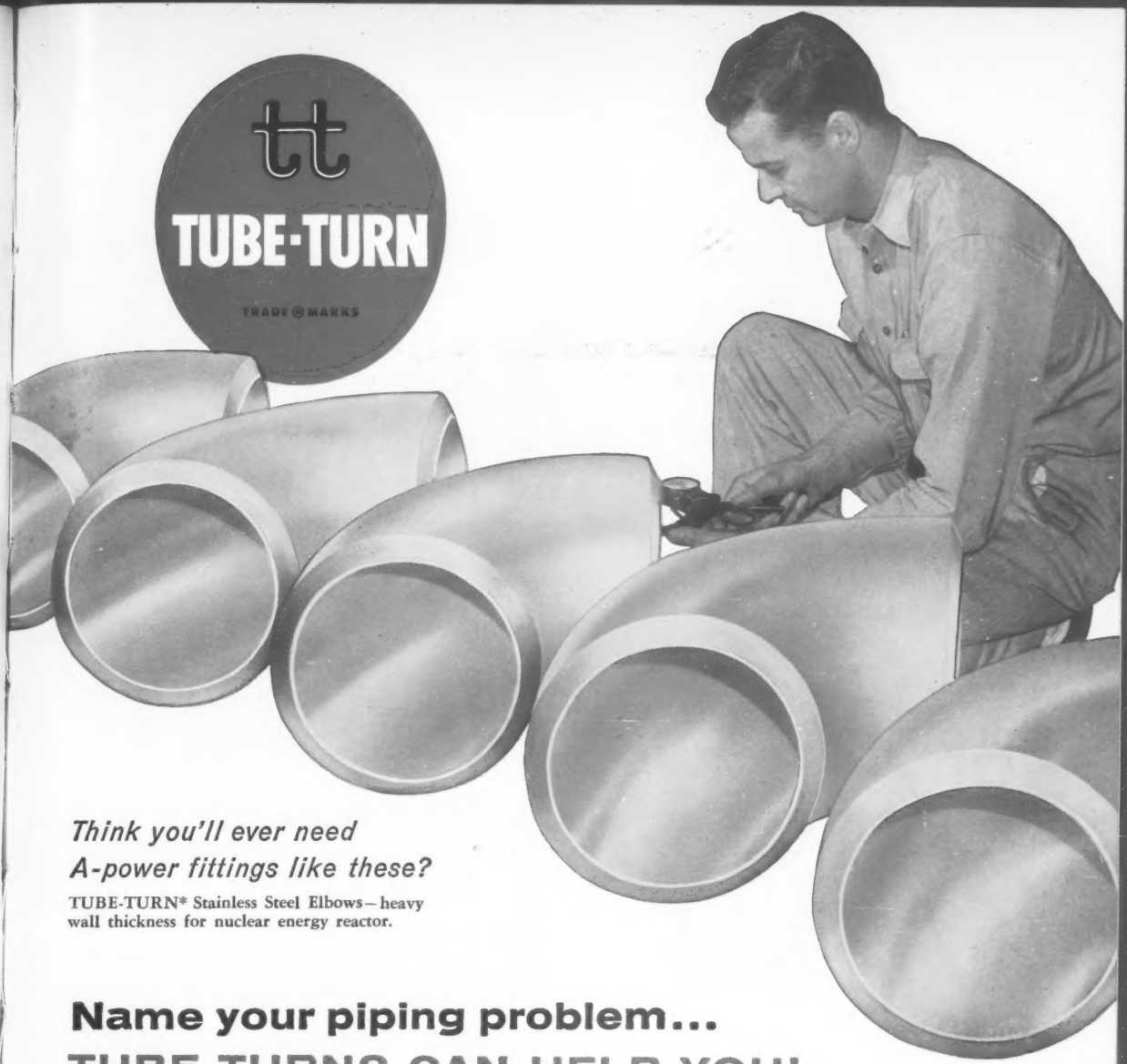
A 4 in. jet pump forces water at a pressure of 120 psi to the base of the lift. Simultaneously two 600 cu ft compressors working at 125 psi activate the lift. At each pocket in the sheeting of all dams, the smallest of the lifts is slid in between the waler and the sheets and run up and down several times to insure clean sheets.

In the largest of the dams 4,600 cu yd of silt was removed in 150 hours by the combination of clam shell and water jet air lift. The mucking method has proved highly successful, and no difficulty has been experienced in any of the dams.

As each dam is cleaned, gravel is then placed in the bottom of the excavation to a depth of 5 ft. The piles are driven through this layer. While it might seem that gravel would be lost during pile driving, actually, except in the channel piers, the earth displaced by the piles causes the bottom to "fluff" between one to two ft. This contingency has been compensated for through the extra preliminary excavation, so it is possible to immediately place required two ft layer of 2½ in. stone over the gravel and proceed with placement of a five ft tremie seal. Five days after placement of each tremie seal, the dams are dewatered, and the piles cut to the proper elevation. The little water that succeeds in getting into the cast in place shells is then removed by means of an air mop, and a bucket is used to fill the shells with concrete.

There has been no equipment shortage on the project—at times Blakeslee has had as many as 12 rigs working in a 500 ft radius. With the job now ahead of schedule, the company's confident of meeting its completion date.

The West River Bridge was designed by Dr. Gregory P. Tschebotarioff of King and Gavaris of New York and Sidney Zecher is their supervising engineer on the project.



Think you'll ever need
A-power fittings like these?

TUBE-TURN* Stainless Steel Elbows—heavy wall thickness for nuclear energy reactor.

Name your piping problem...
TUBE TURNS CAN HELP YOU!

No matter what kind of welded piping system you build . . . here's how Tube Turns can be of help:

Tube Turns' line includes 12,000 *standard* welding fittings and flanges, plus thousands of *specials* such as the A-power fittings shown above. When you buy from this *complete-line* leader, you get what you need *promptly* . . . products of unsurpassed *quality* . . . backed by experienced *engineering service* . . . for reliable, *low-cost piping*. Order from your nearby Tube Turns' Distributor.

*"TUBE-TURN" and "tt" Reg. U.S. Pat. Off.

The Leading Manufacturer of Welding Fittings and Flanges

TUBE TURNS LOUISVILLE 1, KENTUCKY

A Division of National Cylinder Gas Company

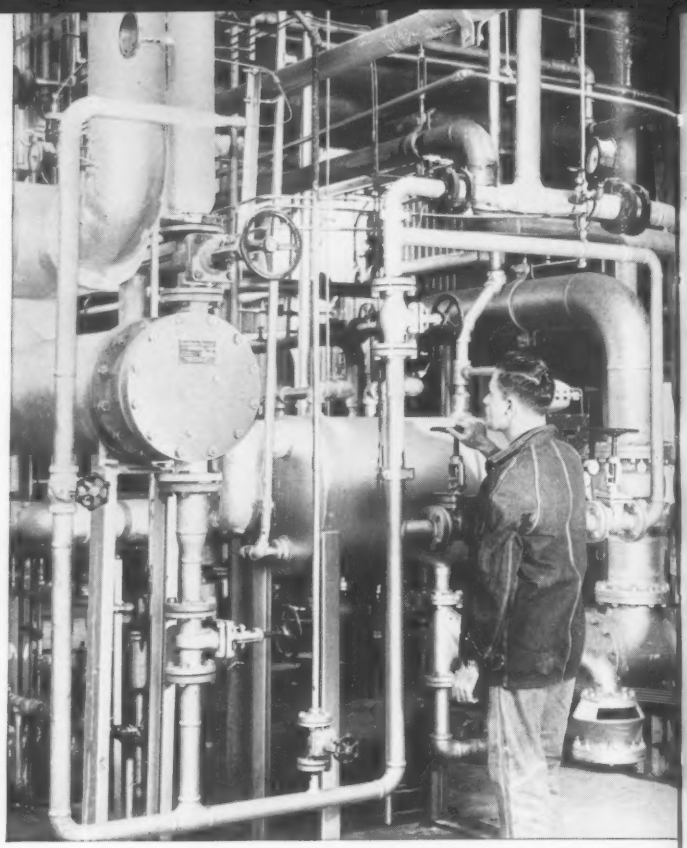
DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Chicago • Detroit • Atlanta • New Orleans • Houston • Midland Dallas • Tulsa • Kansas City • Denver • Los Angeles • San Francisco • Seattle

In Canada: Tube Turns of Canada, Ltd., Ridgetown, Ontario • Toronto, Ontario • Edmonton, Alberta

HOW YOU SAVE

12,000 "TUBE-TURN" PRODUCTS

to help you save 3 ways...



SIMPLIFIES ENGINEERING. There's no compromise when you specify TUBE-TURN products. You can count on getting the exact fittings for your project ...the right type, size, schedule and material for every piping service. Shown at right: Aluminum piping with TUBE-TURN Welding Fittings and Flanges, in water purification plant of The General Tire & Rubber Company, Chemical Division, Ashtabula, Ohio.

SPEEDS UP THE JOB. Uniform size, circularity, wall thickness of TUBE-TURN Welding Fittings assure good fit-up and alignment . . . help make piping installation work faster. Each fitting is marked with *complete* specifications for quick, accurate identification. Quartermarked bevels simplify fabrication.

ONE-ORDER PURCHASING. Your nearby Tube Turns' Distributor provides this complete-line service promptly. Hence, you can make *one order* fill all your needs in welding fittings and flanges . . . to cut red tape and save purchasing time.

HELPFUL DATA. New Tube Turns' booklet gives information on pipe, fitting and flange materials. Mail coupon for your free copy.

TUBE TURNS, Dept. E-3
224 East Broadway, Louisville 1, Kentucky

Please send free copy of Pipe, Fitting and Flange Materials.

Company Name _____

Company Address _____

City _____ *Zone* _____ *State* _____

Your Name _____

Position _____

Available from your nearby TUBE TURNS' distributor

*"TUBE-TURN" and "tt" Reg. U.S. Pat. Off.

TUBE TURNS

LOUISVILLE 1, KENTUCKY

A DIVISION OF NATIONAL CYLINDER GAS COMPANY

DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Chicago Detroit • Atlanta • New Orleans • Houston • Dallas • Midland Tulsa • Kansas City • Denver • Los Angeles • San Francisco • Seattle
In Canada: Tube Turns of Canada Limited, Ridgetown, Ontario Toronto, Ontario • Edmonton, Alberta

Walter W. Underwood

Executive Director Named For Concrete Association

Walter W. Underwood has been appointed executive director of the National Concrete Masonry Association. He succeeds Elmer W. Dienhart, who will act in a consulting capacity to the association.

As executive director Mr. Underwood will supervise over-all activities of the NCMA, which has over 600 members.

A graduate of Princeton University, Mr. Underwood comes to the NCMA from the National Association of Home Builders. In 1955, he was named executive director of the Building Contractors Association of California, an affiliate of the NAHB, and was subsequently shifted to the national organization.

Careers

Business

John G. Fry has been named chief engineer of Santa Fe Railway coast lines, with headquarters at Los Angeles. Since joining the rail line in 1936, Mr. Fry, a Notre Dame graduate, has held various engineering posts, including his most recent one as assistant chief engineer for the coastal division.

Anthony F. Haven has opened an office in Ann Arbor, Mich., for the practice of structural engineering.

Edward B. Moebus and **Samuel B. Roberts** have been elected vice presidents of Lockwood Greene Engineers, Inc., in the New York office.

Loris L. Gerber, a vice president of Prescon Corp., transferred to Denver, Colo. as manager of the company's Rocky Mountain Division. He replaces Lultcho Boduroff, who has become a consulting engineer in Denver. Ben W. Young replaces Gerber as chief engineer in the company's Corpus Christi headquarters.

Robert W. Ramsdell, executive vice president of East Ohio Gas Co. of Cleveland, has been named president of the firm. A civil engineering graduate of Case Institute of Technology, Mr. Remsdell joined the company 30 years ago.

J. Frank Ward opens offices in Seattle as a utility system consultant. For the last three years he was managing director of the Washington State Power Commission, and prior to this, superintendent of Tacoma City Light for seven years.

W. G. Merritt, assistant division engineer for Seaboard Air Line Railway at Savannah since 1951, has been named principal assistant division engineer at Raleigh.

M. Herschel Parsons has been elected a vice president of Turner Construction Co. A former general superintendent, Mr. Parsons will serve as a project executive in Turner's New York office.

G. E. Hauer will head the new industrial water and waste treatment department set up in Infilco, Inc., Los Angeles. He has been serving as vice president of American Well Works.

Government

Col. Paul D. Troxler takes over the post of District Engineer, Jacksonville District, Corps of Engineers, sometime in June, succeeding **Col. Elmer E. Kirkpatrick, Jr.,** who is reassigned to the Mediterranean Division. Colonel Troxler has been serving in the Office of the Chief of Engineers, where he has been assistant to the Assistant Chief for Military Construction in charge of Engineering and Contracts.

Brig. Gen. Frank M. Albrecht has been assigned as South Atlantic Division Engineer, Corps of Engineers, with headquarters in Atlanta. He succeeds **Brig. Gen. Henry J. Hoeffer,** who will retire after 30 years service. General Albrecht has been serving as Director, Plans and Programs Division, Office of the Deputy Chief of Staff for Logistics in Washington, D. C.

Luna B. Leopold is promoted to the top job of chief hydraulic engineer of U. S. Geological Survey's water resources division. He had been assistant chief for program and development, moving up upon retirement of **Carl G. Paulsen.** USGS has also designated **Raymond L. Nace** as assistant chief of the division.

E. W. Cameron is appointed city engineer at Bellingham, Wash., replacing Ted Scholz, who resigns.

Lt. Col. Robert B. Kemp, assistant for field operations at Eastern Ocean District, Corps of Engineers, is assigned the post of Area Engineer for the Sondrestrom Area, Greenland.

Patrick C. Graney, Sr., has been appointed by Gov. Cecil Underwood of West Virginia for a four year term as State Road Commissioner. Graney, a civil engineer with 36 years experience in the coal mining industry, is vice president of Sterling Smokeless Coal Co., vice president and director of the Bank of Mount Hope and president of Petroleum Products, Inc.

Glenn S. Turner, previously city engineer and director of public works, has been named city manager of Pueblo, Colo., succeeding **Russell Rink,** who resigned to become city manager of Toledo, Ohio. A graduate in civil engineering of Colorado A&M College, Mr. Turned was a division engineer for the Denver & Rio Grande Western Railroad before joining the city's staff.

Henry G. A. Hayward, a civilian with the Corps of Engineers, is named vice chairman of the newly constituted Hopper Dredge Board, which keeps the Corps' dredging fleet in operating condition. Mr. Hayward is chief of the plant and special projects branch of the Corps' North Atlantic Division.

Robert D. Austin, engineering chief of the U. S. Bureau of Reclamation's Gila Project, near Yuma, Ariz., has been promoted to chief of the engineering and hydrology branch of Region 3 Project Development Division in Boulder City, Nev.

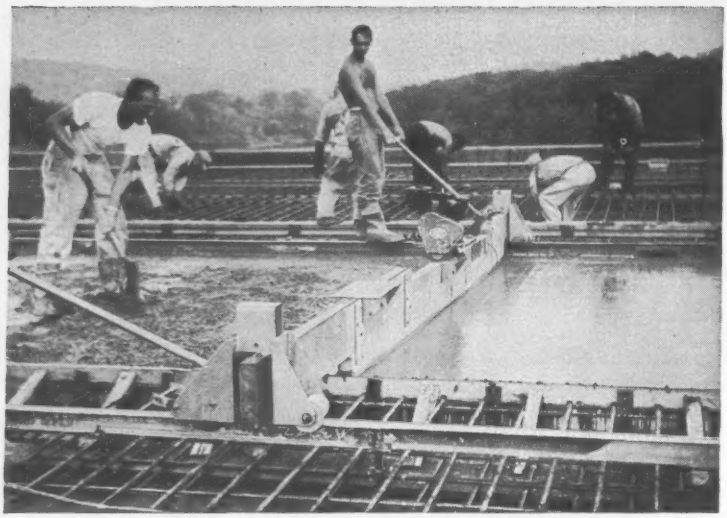
Frank G. Hough, founder and Chairman of the Board of Frank G. Hough Co. of Libertyville, Ill., has announced plans for retirement this year. A pioneer in bulk materials handling and in the tractor-shovel fields, Mr. Hough designed and sold his first hydraulic shovel attachment in 1922, formed his company in 1933.

Brig. Gen. Albert G. Skelton, who is now Portland division engineer for the Oregon State Highway Department, has been retired as a member of the U. S. Marine Corps reserve.

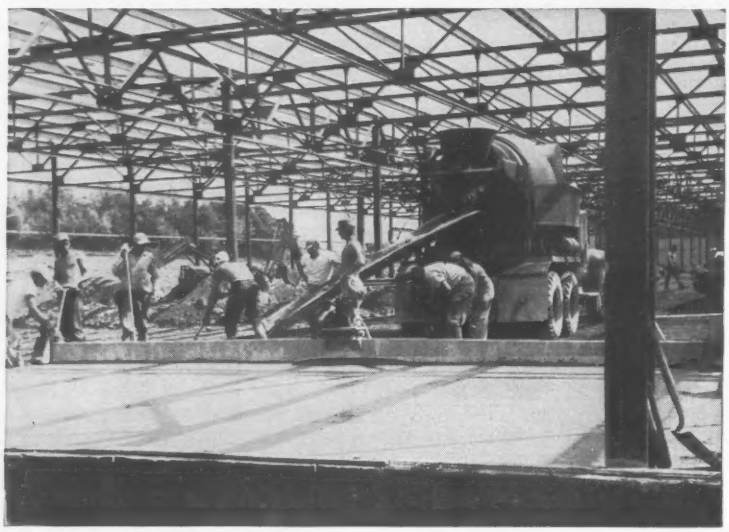
Robert F. Mott, executive director of the Development Committee for Greater Columbus, Ohio, granted a six months' leave of absence to become the city's expressway coordinator.

(M&J continued on page 52)

STOW SCREEDS CUT BRIDGE DECK PRODUCTION TIME IN HALF



Here's the story. The Brunalli Construction Co. had the contract to finish the bridge decks on the Massachusetts Turnpike. They used a Stow 14 ft. vibrating screed, and a 20 ft. screed on the job, employing a special underslung beam so that the "I" beam rails could be located above the surface of the concrete. Because Stow Screeds can strike off *still* concrete smooth and true to grade, experience has proved that they cut production time almost in half . . . even on bridge decks!



Screeding Floor of new IBM Plant.

Here a 25'5" Stow Vibrating Screed strikes off a floor in the new $12,000,000 IBM plant in Owego, N. Y. The entire plant was laid out in lanes of equal width so that the same screed beam could be used throughout. This power unit on this screed can be bought as a package to be mounted on your own beam.

For more information on this equipment, contact your Stow Distributor (listed under "Concrete Vibrators" in the yellow pages of the telephone directory of most cities) or write for Stow Catalog 560—and complete information on Stow Vibrating Screeds, Vibrators, Roto-Trowels, and Concrete Grinders.

STOW

STOW MANUFACTURING CO., 19 Shear Street, Binghamton, N. Y.

. . . Men and Jobs

Education

Merk Hobson, associate professor of chemical engineering and assistant dean, is made dean of the college of engineering and architecture at the University of Nebraska at Lincoln. He succeeds **Roy M. Green,** dean since 1945, who retires July 31.

Retirements

Dean W. Loucks, South Dakota state engineer for the last 20 years, has submitted his resignation. He was reappointed to the job by Gov. Joe Foss, but the appointment was refused confirmation by the 1955 legislature, although he has continued in the job until the present time.

Honors:

Dr. David B. Steinman has been awarded the J. Lloyd Kimbrough Medal by the American Institute of Steel Construction, for his contributions toward public understanding and appreciation of esthetics in steel bridges.

John C. Monning, assistant superintendent of the Los Angeles City Department of Building and Safety, has been promoted from the rank of colonel to brigadier general in the U. S. Army Reserve.

Richard A. Johnson, president of Arthur A. Johnson Corp. of New York City was elected president of The Moles, the association of tunneling and heavy construction men, at a recent annual meeting. He succeeds **Thomas J. Walsh, Jr.**

Associations

Rober K. Lockwood is appointed assistant to the executive secretary of the American Society of Civil Engineers. He leaves the post of executive editor of Civil Engineering, the Society's official magazine, to be succeeded by **H. W. Hunt,** a former editor of Engineering News-Record.

John B. Miller, head of the water division of the bureau of sanitary engineering, Florida State Board of Health, is the new president of the Florida Engineering Society, succeeding **Herbert C. Gee.** The 1958 president, to succeed Mr. Miller, was selected at an Orlando meeting. He is **Harold Briley,** consulting engineer of Daytona Beach.

Robert P. Loveland, Fort Wayne, takes over as president of the Indiana Society of Professional Engineers.

Glenn H. Von Guten, Corps of Engineers, Walla Walla, is the new president of the Pacific Northwest Conference of the American Society of Civil Engineers.

L. F. Quinn of Miami, Ariz., has been appointed a member of the Arizona State Highway Commission.

6 FACTS

to consider before you buy any heavy-duty tractor

Purchase of a modern, heavy-duty tractor is a major investment — one to be carefully considered. You want to be sure your new tractor fills today's need for *speed* and *mobility* ... as well as *power* and *traction*. Check these 6 important performance factors before you buy:

1. On dozing operations, your tractor operator's probably shift gears twice per minute of operation 100 times in a 50-minute hour, 1,000 in a 10-hour day. Time studies indicate you lose 5 seconds (plus momentum) on each of these gear shifts. Letourneau-Westinghouse Tournatractor® has instant shift through constant-mesh transmission, therefore can give you a plus of 5,000 seconds or 80 minutes production time in a 10-hour day!

2. Drawbar ratings on crawler tractors are made on basis of *clean tracks* and *rollers*. You have only to look through the tracks at your pan and guards to realize that these theoretical ratings are never available on your actual dirtmoving operation. Power used in grinding sand, rock, dust, and mud in moving parts of the track assembly is not available for moving dirt.

3. When you compare maintenance costs try to check on *how many* MILES *you get on a set of tracks.* On fairly rough work, owners usually replace a set of tires in from 3,000 to 5,000 hours. At an average travel of six miles each hour this represents from 18,000 to 30,000 miles of Tournatractor travel. On an average, we think you will find your *mileage* on a set of tracks will show *less* than half your *mileage* on a set of rubber tires. Incidentally, combined cost for labor and parts for complete track rebuilding is more than double that for recapping a set of tires. A complete set of tires can be replaced in a few *hours;* reconditioning a set of tracks takes at least double that many *days* of hard work.

4. Now offered, as optional equipment, are 26.5 x 25 wide-base tires for Tournatractor. These tires give about 20% more traction area. They are recommended for use wherever extra flotation is needed for soft going, or where extra traction is needed for a plus in drawbar over loose dirt, soft clay, sand or other types of soft footing.

5. Hydroflation of tires offers means of obtaining extra traction and drawbar over standard Tournatractor ratings when needed.

6. Do not overlook the price advantage in favor of Tournatractor! Also the fact that for 10% less you get a much greater value. You have anti-friction power from engine to drive-wheels, dirt-tight oil enclosures and grouped lubrication through a minimum of lube points. You have the simplest system of controls, push-button operation, maximum visibility. Many other safety features — plus 17 mph go-anywhere mobility, for on-the-job or job-to-job moves.

It will pay you to investigate Tournatractor's advantages on your specific operations. We'll be glad to send a specialist on Tournatractor application to talk to you. Or perhaps first you'd like to *read* more about Tournatractor and where it fits into today's tractor problem. Why not ask for new 32-page illustrated bulletin. It will show you how both Tournatractor and crawlers measure up to the 4 essential dimensions of present-day earthmoving ... mobility ... speed ... traction ... power. Write or call us today.

CT-1186-G-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT

Excavate and load

600,000 yds.

with 2 graders

J. D. & P., Inc. equips 2 "660's" with ELEGRADERS

Johnson, Drake, and Piper, Inc. faced the problem of moving 600,000 yards of dirt 3½ miles over city streets in suburban Buffalo, for a new section of New York Thruway. Contractor found the solution in hauling by truck . . . digging and loading clay material with two 150 hp Adams* 660 motor graders with outrigger Elegrader attachments.

27 trucks haul to bridge approach

Photos show J. D. & P. loading out dirt to build up a thruway bridge approach. 27 sideboarded 10-yard dump trucks each hauled 12-yard loads over city streets to the fill. Two dozers, a sheep's foot roller, and a 50-ton pneumatic roller, spread and compacted the dirt. At the borrow, a grader bladed off-highway haul roads and maintained the pit.

Trucks hauled approximately 3½ miles (one way) — including 1200' over rough construction sand at the borrow exit. Haulers' return route included a 500' entrance to borrow, over grader-maintained construction haul road of average quality.

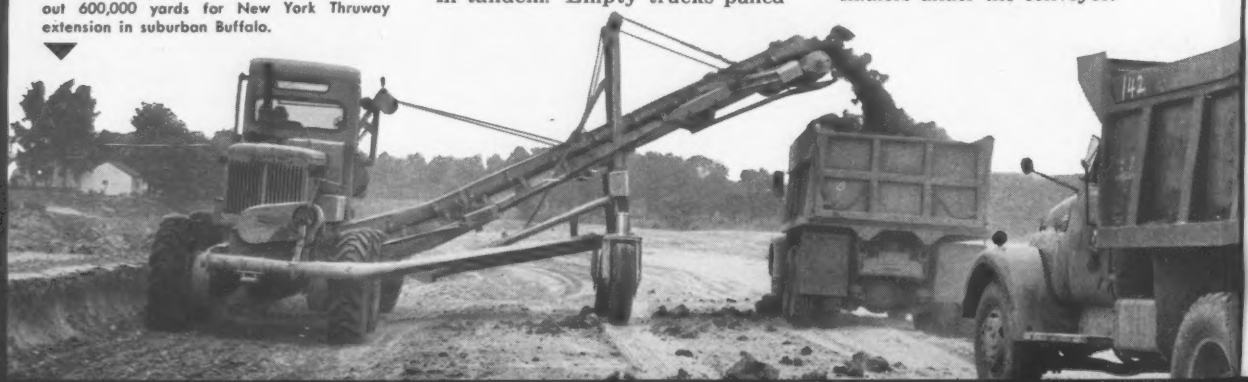
Loads from ¾ mile-long borrow

Two "660's" with Elegraders loaded trucks in a flat area, cutting against the outer perimeter of the ¾ mile-long borrow. The two loaders worked in tandem. Empty trucks pulled under the conveyor of whichever unit was available. On this stripping operation, there was very little truck waiting time — in fact, Elegraders could have kept more trucks busy on the lengthy 3½ mile haul.

Strips clay @ 460 yds. per hour

Elegraders and trucks worked two 8-hour shifts daily. An extra man was assigned to ride the front end of each of the Adams graders to aid in truck-spotting, to count loads with timer, and to assure that haulers got a full load, fast. Each Elegrader excavated and loaded at the rate of 460 loose yards of medium density clay per hour. Stop-watch timing showed Elegrader heaped trucks in as little as 40 seconds loading time per truck . . . plus an average 10 seconds for positioning of haulers under the conveyor.

Adams 660 grader with outrigger Elegrader strips 18" of clay fill along perimeter of ¾ mile-long borrow. With 2 Elegraders, Johnson, Drake, and Piper, Inc. excavated and loaded-out 600,000 yards for New York Thruway extension in suburban Buffalo.



Elegrader's 32" disc plow cuts and feeds continuous ribbon of clay material onto fast-moving, trough-type belt conveyor. Although loading was limited to 41.2 minutes hourly (by the rate at which trucks could return from the 3½ mile haul), Adams 660 with Elegrader loaded 460 loose yards per hour into trucks on J. D. & P. job.

Cut 18" deep at 2.3 to 3.3 mph

As the LeTourneau-Westinghouse grader moved forward in 1st or 2nd gear, Elegrader's 32" disc plow "peeled off" strips of almost-dry clay averaging 18" deep. On the first slice, cut-depth sometimes reached 30" because of uneven ground. The endless ribbon of dirt fed onto 42" wide, grader-driven, trough-type belt moving 450' per min. Conveyor elevated dirt to overcast into trucks with little dust or spillage.

Other uses for Elegrader

Elegrader is a useful tool for other roadwork. It's often used on secondary roads, for cutting roadside drainage ditches and casting up dirt to elevate roadway. If it's desirable to haul material for fill or waste, it can be loaded into trucks moving parallel.

Get information and prices

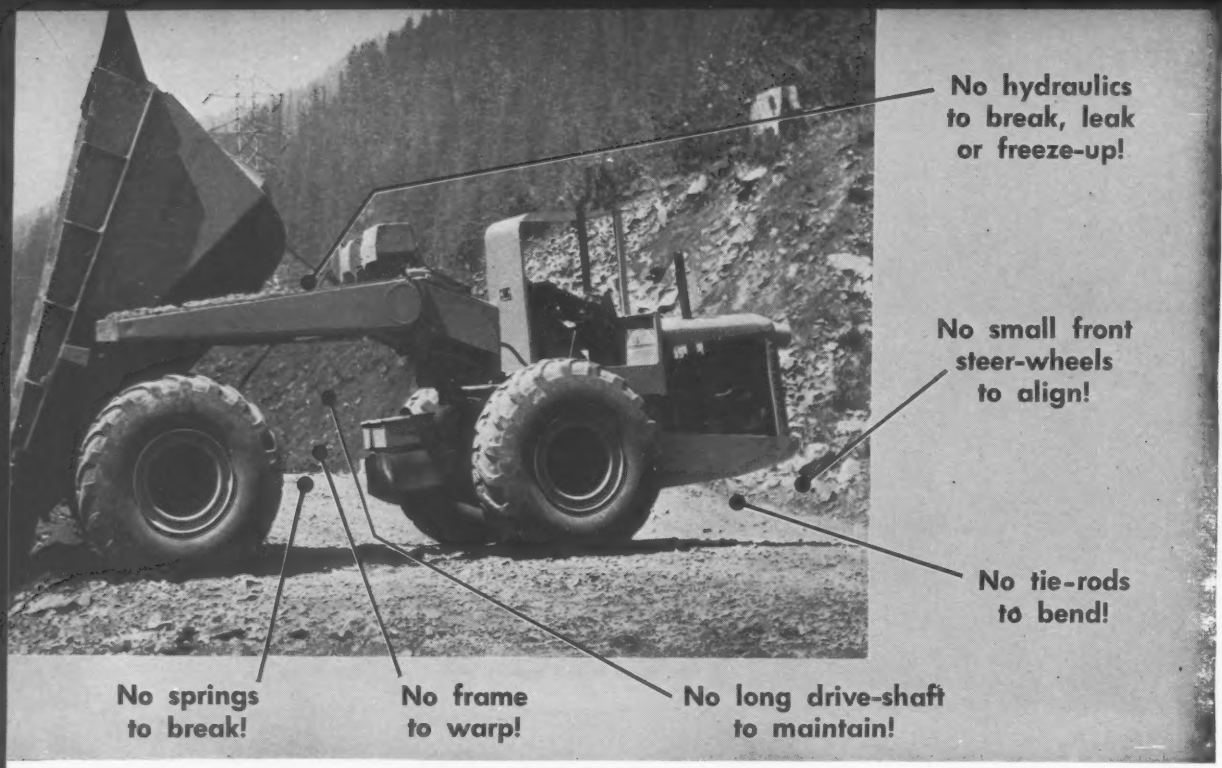
Call or write us and we'll be glad to give you full details on Elegrader for use with 104, 123, 150, 190 hp Adams Graders. Other grader models: 60, 80 hp. Information is FREE . . . there's no obligation.

*Trademark AE-1254-H-6

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit


No hydraulics to break, leak or freeze-up!
No small front steer-wheels to align!
No tie-rods to bend!
No springs to break!
No frame to warp!
No long drive-shaft to maintain!

Cuts your hauling costs!

Tournapull Rear-Dump overcomes most maintenance problems of conventional haulers

Construction of Tournapull Rear-Dump is radically different (and much simpler) than that of a conventional heavy-duty hauler. In place of a foundation frame and body sub-frame, Tournapull Rear-Dump hitches rear and front wheels through a horizontal yoke extending back from the kingpin, and pivoted to body itself just above and ahead of rear wheels. Body is simpler, much stronger . . . has no frame and sub-frame to get out of line.

Look at the photo above . . . note the absence of springs, spring hangers, and tie-rods. Low-pressure tires adequately absorb the shocks of rough haul-road travel and shovel loading. Eliminated are spring maintenance, replacement time, and cost of spring parts.

Front-wheel drive and kingpin-type power steer helps simplify Tournapull construction, too. No longer must power be carried back to the rear through a drive-shaft. Bearing and lubricating problems of a long drive-shaft are eliminated. No longer is steering handled by small front wheels subject to "bulldozing" and misalignment. There are no tie rods, no hinged steering connections to become twisted or bent.

Nor do you have the troubles of hydraulic hoists or gravity dumping with these Rear-Dumps. Dump is by an electric winch, that lifts the body up on twin cables. Operation is under complete control at all times — with positive power for dump and return controlled by an electric switch on the dash. There are no oil seals, hydraulic pumps . . . no high-pressure lines and jacks to keep tight . . . no freezing up in cold weather as with hydraulics. There are no shock loads as in gravity dumping. You save on regular maintenance time because there is no hoist mechanism to check . . . only a few places to inspect and lubricate.

Let us show you how these savings can put money in *your* pocket. For proof, we'll be glad to show you performance figures from a job like yours. Or, if you wish, we'll give you names and addresses of nearby owners of Tournapull Rear-Dumps, so you can check the facts for yourself.

Model D — 11 tons, 138 hp

Model C — 22 tons, 208 hp

Model B — 35 tons, 293 hp

Now available with optional tailgate. Prime-mover also powers interchangeable scraper, bottom-dump, flat-bed, crane, logging arch.

Tournapull—Trademark Reg. U.S. Pat. Off. R-1171-G-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Obituaries

William E. Woodruff, 49, manager of public relations for The Associated General Contractors of America, and managing editor of the association's magazine "The Constructor", died May 2, as result of injuries sustained in an automobile accident. A native of Lakewood, Ohio, Mr. Woodruff had been a resident of Washington, D. C., since 1931.

Walter F. Reichardt, 76, retired civil engineer, died May 13 at Forest Hills, New York. A native of Little Rock, Ark., his long career included supervising engineer for construction of Camp Beauregard, La., director of public works at Milwaukee, Prairie du Chein and Shullburg, Wis. He held an engineering degree from the University of Arkansas.

William J. Whitehead, 75, a former superintendent of waterworks construction and water tunnel maintenance for the city of Cleveland, died April 19 in New York City. He was a civil engineer and was with the city for about 40 years before his retirement several years ago.

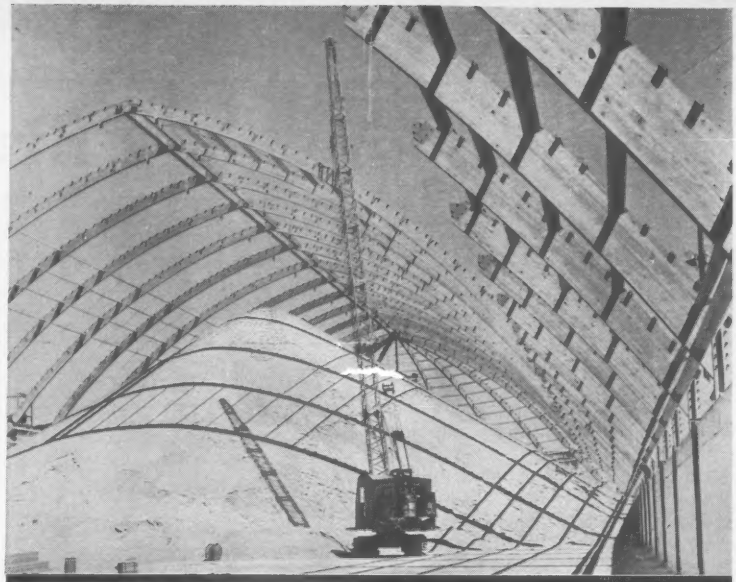
Edward D. Fox, 60, chief designer of civil and construction engineering for the Erie Railroad, died April 23 in Cleveland. Associated with the railway since 1928 in various engineering capacities, Mr. Fox first established his home in Cleveland in 1931.

Lewis G. Fisher, 80, a retired New York State Department of Public Works civil engineer, died April 27 in Rochester, N. Y. For many years engineer for the City of Rochester, he was a graduate of Rensselaer Polytechnic Institute.

Kenneth F. Goodson, 44, resident manager at Ravenswood, W. Va., for Kaiser Construction Co., and formerly general manager of the NATO air base project in Iceland, died April 29 at Marietta, Ohio.

William F. Schepflin, 71, retired Fremont, Ohio, road contractor and a past president of the Ohio Society of Professional Engineers, died in Fremont April 26.

Charles J. Dougherty, 74, Delaware contractor died early in May at Wilmington. Mr. Dougherty formed his own company, C. J. Dougherty & Sons, Inc., 45 years ago, and was responsible for construction of many buildings throughout the state, including churches and schools.



Above: POTASH COMPANY OF AMERICA, warehouse number 7, Carlsbad, New Mexico, is 179'-8" x 400' plus half circles of 179'-8" diameter at each end. Left: Concrete pilaster wall supports cantilevered timber buttresses. Center: Hinged connection joins timber buttress to arch.

2¼ acres of permanent low cost space . . . with glulam buttressed arches by Timber Structures, Inc.

In construction of this 2¼-acre clear span warehouse, POTASH COMPANY OF AMERICA used glulam buttresses and arches to save $60,000 over the cost of other framing. At the same time they prevented possible damage to the framing through chemical action of the stored material, for timber is inert to chemical action, and requires no special protection for use with chemical materials.

Glulam timber buttresses resting upon a concrete pilaster wall support the arches which frame the roof structure of the warehouse. By using buttresses and arches instead of continuous arches it was possible to reduce the section size of the arches, with a substantial saving in cost.

Imaginative use of timber for your wide span structures may make similar economies for you while providing permanent, maintenance-free construction. For information on engineered timber members, see our insert in Sweet's Architectural and Industrial Construction files, or consult your nearest Timber Structures representative. Also write for comprehensive brochure, "Buildings for Tomorrow", which will be sent free upon request.

TIMBER STRUCTURES, INC. P. O. BOX 3782-C, PORTLAND 8, OREGON

Offices in Ramsey, N. J.; New York City; Boston; Philadelphia; West Hartford; Cleveland; Charlotte; Chicago; Centerline, Mich.; Kansas City; Kirkwood, Mo.; Minneapolis; Wichita; Des Moines; Dallas; Houston; Birmingham; Seattle; Spokane; Denver.

Local Representatives throughout the United States and Canada

TIMBER STRUCTURES, INC. OF CALIFORNIA • Richmond • Beverly Hills • Sacramento

World Fair Spurs Brussels Traffic S

With the nation's World Fair—more correctly the Universal and International Exhibition—only 14 months away, Belgium has used the occasion to push through a major achievement in traffic engineering. It is hoped the plan will unscramble the maze of narrow congested streets of the nation's capital of Brussels.

The Belgian Minister of Public Works, Omer Vanaudenhove, was faced with this problem:

Brussels, a city of about a million, expects an average of 150,000 additional visitors daily while the Fair is open, and may see peaks of half a million visitors on special days.

Both to take care of this expected influx of visitors and to make a major contribution to the city's long neglected traffic pattern, Vanaudenhove is pushing a program costing roughly $40 million, spread over two years. The program is being carried forward with the least possible demolition of existing structures in the city, by the simple expedient of doubling—either above or below ground—the traffic carrying capacity of the streets.

Financing problems and labor shortages have necessitated stripping the work down to its barest essentials, but the plan will be a major start on a long-range scheme that will make Brussels a city of three concentric ring roads—Little Belt, Big Belt and The Ring—approached by a number of modern highways with an adequate set of access roads between the outer ring and the center of the city.

The important problem at the moment, however, is to eliminate as many traffic bottlenecks as possible before the opening of the exposition, starting with suburban approach roads and the center of the city and then moving from the approach roads to the exhibition site itself.

The inner Little Belt, luckily, was complete before the plan went into effect. It consists of the line once occupied by the 500-year old fortifications which were demolished more than a century ago. A moat was filled in to provide a broad roadway. There is plenty of space in this tree-lined, heart-shaped boulevard, which bears a different name in each section, but it wasn't good enough as a modern motor road because of light-controlled crossings at the sites of one-time gates in the city walls and because of the ubiquitous trolley cars within the city.

CENTER OF ATTRACTION for motorists from heavy populated surrounding areas is the City of Brussels, hub for many major highways. Faced with added traffic when world's fair opens, city officials are pushing beltway construction to ease traffic problems.

• **In-not around**—Surveys indicate comparatively few of the cars coming into the city are through traffic, thus a by-pass road need not be the first consideration. However, six international roads, connecting the city with Paris, with London (via the English Channel), with Antwerp, with Germany, Luxembourg and other areas converge on the metropolitan area.

Some idea of the extent of motor traffic can be gained from traffic studies which show that vehicles coming into the city have risen as much as 50% in the last five years. A 1955 count showed an average of 87,000 cars daily using the Outer Ring; 122,000 in the area between The Ring and the Big Belt; 242,000 between there and the Little Belt, and 167,000 crossing the Little Belt to or from the center of the city.

• **Pampered trolleys**—A problem facing the public works engineers was im-

...ic Solution

mediately evident: as much of the traffic as possible must be freed from controlled intersections and from the hold-ups incidental to having to cross and re-cross trolley lines; and the Little Belt must be improved so that efficient traffic distribution could be promoted.

One of the major problems is the fact that it is impossible in Belgium to speak disrespectfully of trolley cars. They are in the province of the Ministry of Communications, which firmly believes in them because they utilize home-produced electricity instead of imported gasoline.

They take a lot of road, move at their own stately speed, their tracks cause innumerable skids, but they have absolute traffic priority over all other forms of transport except columns of troops and funerals.

Moreover, each tram driver is granted police powers and there is no way of smashing into a tram and getting away with it.

Mr. Vanaudenhove is in fact achieving wonders by relocating the tracks so that they run on their own right-of-way, protected by trees or lines of parked cars from the automobile traffic and, so far as possible, not crossing the main traffic stream. In each case, however, he has had to justify the change by pointing out that it will be much nicer for the trolleys in the new situation.

• **Crossings under**—The most important jobs are on or connected with the Little Belt, near the heart of the city. Only one of the Brussels crossings has been straightforward enough to be dealt with by simply tunneling under the boulevard and then re-bridging the tunnel for the approach road. This was the crossing of the Rue de la Loi, Brussels' street of government offices. Here the fast center lanes of the road (four traffic lanes) will be at a lower level for about 200 yards, including ramps.

Far more ambitious is the crossing at the Porte de Louise, where the aristocratic Avenue Louise brings down to the Little Belt a large volume of suburban traffic as well as much of the traffic from the cities of Charleroi, Namur and Mons.

A couple of hundred yards before reaching the Little Belt, the Avenue Louise suddenly narrows from 55 meters between buildings to 20 meters, much less than adequate for the 40,000 vehicles it carries daily. However, since the area is one heavily built up with high-type offices and luxury apartments, the cost of widening would have been prohibitive.

The answer was a tunnel under a tunnel.

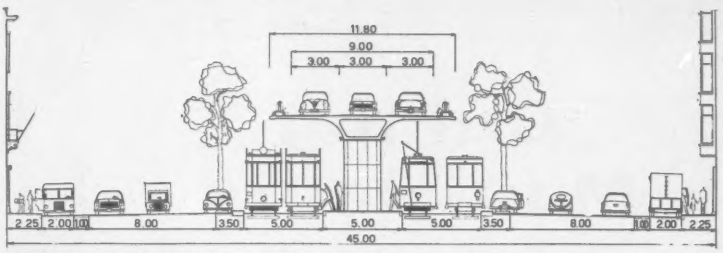
A shallow tunnel will carry a four-lane section of the Little Belt under the business area, allowing space above it for parking and local traffic. A deeper tunnel under the first will carry the Avenue Louise itself with a central depth of nearly 30 ft. This tunnel will begin at a point before the avenue narrows, and carry a four-lane roadway under the whole length of the bottleneck, emerging beyond the crossing. The tunnel will be fully underground for 500 yd. A branch of this tunnel, which will be reached by a turn underground, will carry traffic downtown to the Little Belt.

Perhaps more spectacular is the succession of works between the Place Quetelet corner, where the Little Belt boulevard turns down hill, to the Avenue Leopold II where the traffic for the Ghent road has crossed the Charleroi canal and left the Little Belt. This turn is made more difficult by the trolleys and by the fact that the road runs downhill with frequent interruptions by traffic lights, leading directly into the central shopping area of the city. This road is heavily traversed by trucks. The solution is a tunnel that will carry the traffic under most of the congested cross streets, emerge to ground level in the shopping area and duck underground again where it reaches the Little Belt a second time. At this point it cannot be taken underground because of a number of canals and an underground river. Instead, traffic will be carried on an elevated structure three lanes wide and out of the city.

• **Elevated road**—The main point of interest to engineers is the overhead elevated road, which will be constructed of prestressed concrete slabs to a total width of 11.80 meters. The road will be carried on a single row of columns with a T-shaped vertical cross section, and trolley tracks will be tucked under the roadway.

Outer edges of the roadway will carry flower boxes and potted shrubs.

(*International continued on page 61*)



OVERHEAD ROADWAYS—with streetcars under the elevated structures—offer more vehicle space without demolishing buildings.

TUNNELS in the streets will increase traffic capacities of existing roads, bypass congested areas.

Cutting Man-Hours

Here's a Homelite Dual-Voltage Generator in action . . . working for profits two ways. One man is operating time-saving universal power tools. And at the same time, one man . . . not three men . . . just one man is operating a Homelite High-Cycle Concrete Vibrator on the forms. The power for both comes from one lightweight, carryable generator. The savings in man-hours are yours. A Homelite man will give you an on-the-job demonstration. Or write for full information.

HOMELITE
A DIVISION OF TEXTRON INC.
1105 RIVERDALE AVE., PORT CHESTER, NEW YORK
MANUFACTURERS OF CARRYABLE PUMPS
GENERATORS · BLOWERS · CHAIN SAWS

Bridging Ganges Is Top Rank India Project

India's $34 million project of bridging the 2¼ mile wide Ganges River at Mokemah, halfway point in the 500 mile unbridged length of the river between Benares and the mouth, will soon be in the steel erection stage. Of the 15 main piers and 4 approach piers, half are finished and the remainder will be completed this month, G. Pande, chief engineer, told ENR's correspondent. Eighty percent of the steel has also arrived from Great Britain.

Less than half the river valley will be crossed by a structure, the remainder being a fill about 40 ft high. The view above is of a trestle being built to construct this fill, which will block this channel between the north bank and an island, which is submerged during flood season. A dike has also been built lengthwise of this island to guide the more than 2.5 million cu ft per sec flood flows into the bridged south channel. In total, this fill work has involved the placing of 3 million cu yd of material. The river bed consists of fine sand with some clay silt mixtures, and the piers have been sunk through this material by means of open steel caissons to a depth of 160 ft below low water.

The bridge superstructure, which will carry a double track rail line on a lower deck and a 24 ft roadway above, will consist of fourteen spans of 403 ft and four shorter approach spans. The main trusses, of double-intersection type with mid panel verticals, will be 60 ft deep.

Earth Train for Russia's Bratsk Project

Russian machinery moves earth in preparation for construction of Bratsk hydroelectric project, expected to be the world's largest. The dam and powerplant that will go up on the Angara River in Siberia are planned to provide a power potential of 3.6 million kw. The dam is designed to be three miles across and 425 ft high. The Bratsk scheme is part of Russia's ambitious efforts in power production and transmission (ENR Oct. 11, 1956, p. 27).

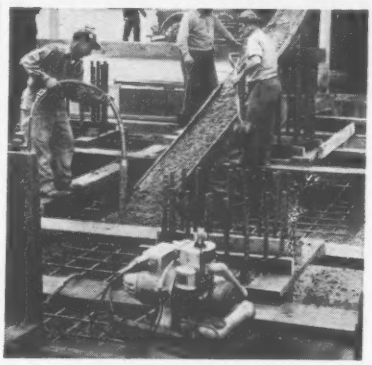
(International continued on page 62)

Photo by Sovfoto

Full Line of Carryable Construction Equipment Now Offered by Homelite

Carryable Diaphragm Pump . . . This self-priming, 120 pound diaphragm pump will handle water in the thickest sand, muck, or mud. Capacity: 5,000 g.p.h. Size: 3". Complete line of centrifugal pumps are also available in sizes from 1½" to 3".

Chain Saws For Every Job . . . Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.



One-Man Electric Vibrator . . . It takes only one man to place concrete with powerful, Homelite high-cycle or universal electric concrete vibrators. Carryable Homelite generator provides power for high-cycle vibrators *and* 110 volt DC for all universal vibrators, tools and floodlights.

HOMELITE

a division of Textron Inc.

PORT CHESTER, NEW YORK

HOW TO BUILD AT LESS COST

Use Steelcraft Standard Steel Buildings!

Over-all, you can save thousands of dollars in material and labor because Steelcraft structural members are mass-produced to factory standards . . . pre-engineered for fast field assembly with a relatively small work force. Erection takes only weeks instead of months, so you *quickly* and *profitably* obtain full use of your new facilities.

You can choose from many standard design variations and options to get a building tailored exactly to your needs. These permanent buildings can be used for manufacturing, warehousing, offices, garages . . . any application. And, you automatically acquire "built-in" provisions for economical future expansion. Masonry or other collateral materials can be used as veneer to lend distinctive personality to the structure.

Steelcraft dealers can give swift delivery and complete erection service.

SEND FOR NEW 20-PAGE CATALOG

describing building types, construction details, and applications.

THE STEELCRAFT MANUFACTURING COMPANY

9017 BLUE ASH RD. DEPT. 35-E
CINCINNATI 42, OHIO

I want to find out how to build at *less cost, faster, better*. Rush me your new catalog of STEELCRAFT STANDARD STEEL BUILDINGS.

NAME _____

CO. _____

ST. _____

CITY _____ STATE _____

Argentine Capital Plans A $5 Million Subway Link

Buenos Aires has asked for bids in June for construction of a 1.6 mi subway line that will connect existing lines.

The $5-million project would start at the San Jose station, where two platforms will be built, and continue in a gentle curve to the present Independencia station, thus also connecting the city's two railway stations. Two new stations, at Avenida Belgrano and at Calle Bolivar, will be included in the work.

Panama Seeks $16 Million For Inter-American Road

Panama, which estimates cost of completing 316 miles of Inter-American Highway from its Costa Rican frontier to the Panama Canal at $48.9 million, will seek a loan of $16.8 million to finance part of the work.

The Panamanian estimate, according to the International Road Federation, is $15.6 million higher than that made by the U. S. Bureau of Public Roads in 1955. Local observers say that although some of the difference in the two estimates may be attributed to the increased costs since 1955, the major difference lies in the country's choice of concrete which, says IRF, is three times more expensive than asphalt in Panama.

The United States will pay two-thirds of the cost of building the highway to Central America from the Guatemalan-Mexican border to the canal—but on the basis of asphalt surfacing. Since Panama historically has used concrete, agreements with the U. S. provide that Panama pay the cost difference between asphalt and concrete.

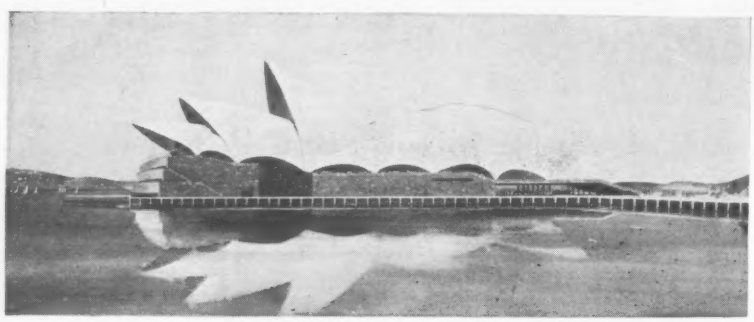
Group Offers A Single Bid On $268 Million Oil Works

What is said to be the largest industrial consortium ever assembled—International Contractors and Suppliers Association (ICSA)—submitted a bid of $268 million to carry out the entire Argentine oil program of pipeline and refinery construction.

If the ICSA offer, the lowest of 14 bids submitted, is accepted, work is expected to start in July and to be completed in 3½ years.

Included in the work is a gas pipeline system from Campo Duran to Buenos Aires; an oil pipeline system from Tucumma to San Lorenzo; a gas processing plant at Campo Duran; a finished product oil pipeline from Mendosa to Buenos Aires to La Plata; two distilleries and a lubricant plant. The projects will require some 400,000 tons of steel.

ICSA is composed of two groups—International Contractors Association, which is a group of companies specializing in pipeline construction and heavy industrial installations, and International Suppliers Association, companies that manufacture materials called for in the program. The International Contractors group is headed by John Williams, of Williams Brothers, Tulsa,



Concrete Vaults to Roof Opera House

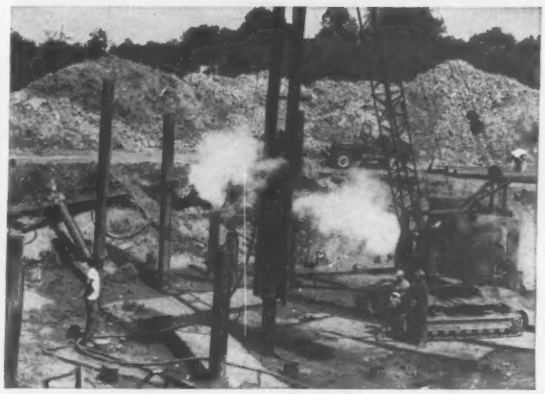
A world-wide design competition for the Sydney, Australia, national opera-house has been won by a Danish architect, Joern Utzon of Hellebeck, Denmark.

The roof of the structure is a series of interlocking thin-shell concrete vaults.

The 3 story opera house will have an auditorium seating 3500 people, a smaller concert hall seating 1,200, a lecture room for 200 and provisions for restaurant-bars, and adequate rehersal and dressing rooms.

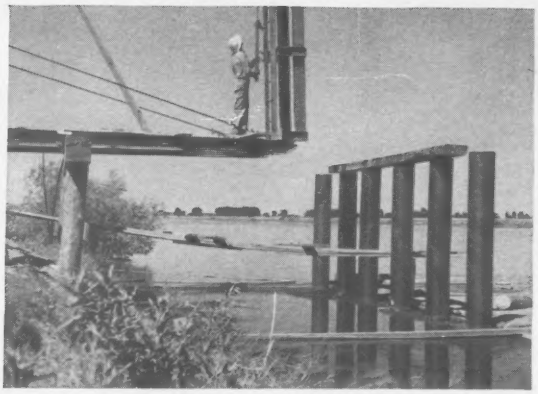
It is estimated the structure will cost $7,840,000. Construction is expected to start in early 1959.

Long, Straight Armco Pipe Piles Were Driven on All These Jobs



INDIANA—SEWAGE TREATMENT PLANT

Armco Pipe Piles being driven here are 12" in diameter with .188" wall.

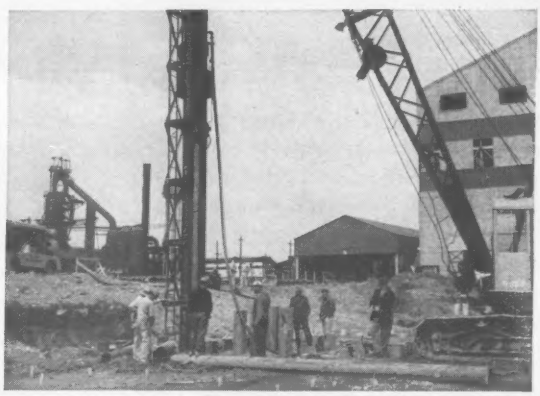


IDAHO—HIGHWAY BRIDGE

In this river crossing, Armco Pipe Piles are 14" in diameter, .188" wall.

ALABAMA—RAILWAY BRIDGE

Bridge bents are of Armco Piles, 24" in diameter, .500" wall.



OHIO—INDUSTRIAL BUILDING

In this industrial expansion, Armco Piles are 10¾" diameter, .250" wall.

When bridges or buildings need foundation support, you can depend on Armco Pipe Piles to do the job. They are supplied in straight, extra-long, exact lengths to meet your requirements.

With ordinary pile driving equipment and by exercising reasonable care, you can drive Armco Pipe Piles without top reinforcement. Each blow is transmitted to the pile end with minimum loss of force. Piles drive straight and true.

Armco Pipe Piles are of spiral, butt-welded fabrication. Diameters from 8⅝" to 24", O.D., wall thicknesses from .141- to .500-inch. Standard lengths up to 60 feet, longer lengths also supplied.

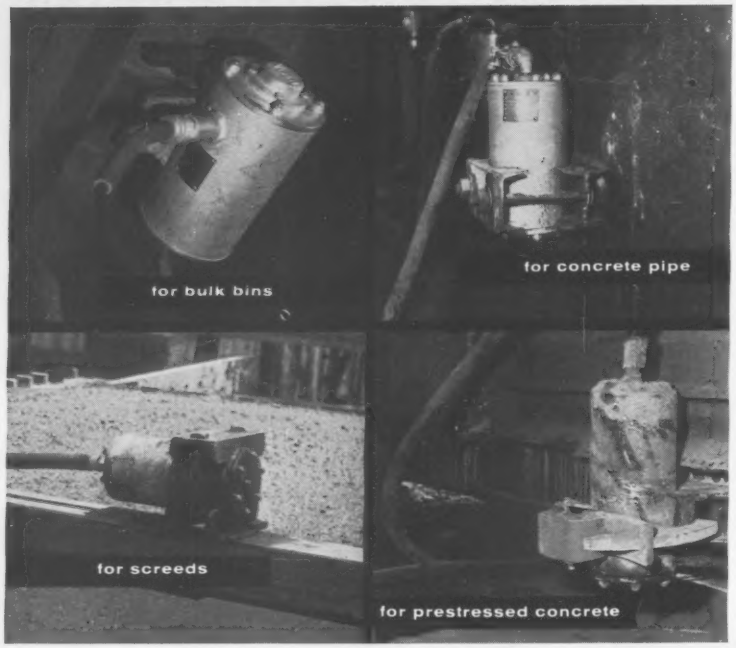
* * *

Armco Pipe Piles are only one of the more than 30 Armco Products for engineering construction. Another Armco Piling used in similar foundation applications is HEL-CON® Pile Shell. Many other all-metal products are designed for highway, railway, industrial and municipal uses. Write us for more data. Armco Drainage & Metal Products, Inc., 4967 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO

CONSTRUCTION PRODUCTS

Most Effective Vibration



Viber External Vibrators

Wherever reusable steel forms are set up on a production basis—in concrete pipe production, in the precasting of prestressed girders, beams, roof and wall sections, and in cast-in-place operations such as tunnel lining—VIBER external vibrators offer the dual benefits of reduced cost and improved quality.

In concrete placing, VIBER high speed, low amplitude external vibration increases production, improves quality, promotes economy, reduces absorption and permeability, and strengthens the bond between concrete and concrete, or concrete and steel. This high speed and low amplitude also minimizes the possibilities of damage to expensive forms.

In bulk materials handling, VIBER external vibration speeds the flow of all materials, from the finest powders to large solid pieces—during loading or unloading; while moving through chutes, bins, hoppers or pipes; when measuring, packaging or sorting.

High speed, low amplitude external vibration, pioneered and perfected by the VIBER Company, offers many advantages in concrete placement or bulk materials handling. VIBER vibrators have been proved by hundreds of laboratory and field tests and the practical experience of cement associations, highway departments, contractors, concrete product manufacturers and others.

Seven models of VIBER external vibrators meet an unlimited variety of applications; they are designed for permanent or temporary mounting; speed and amplitude may be regulated; pneumatic or electric power may be used.

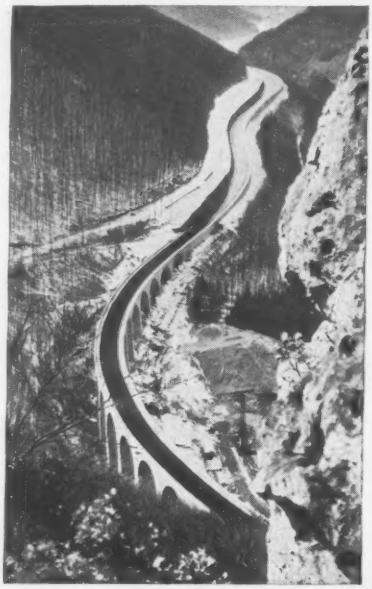
Write today *for illustrated literature and factual information for solving your vibration problems. Viber Company, 726 South Flower St., Burbank 10, California.*

VIBER CO

VIBRATORS

Pioneers and leaders in the manufacture of vibrators.

Okla., while the Suppliers group is headed by Jean-Laurens Delpech of Paris. The Williams firm is the only U. S. organization represented.



New Stretch of Road Winds Through German Hills

Winding its way through the hills between Stuttgart and Ulm in southern Germany, a new stretch of Autobahn is now nearly ready for traffic. Slightly over 4 miles long, the section cost about $7 million and took two years to complete.

Built to carry two lanes of traffic, the roadway is widened at the curves, and has been revetted on both sides to prevent landslides and snowslides. Dark appearance of road on elevated structure is caused by weatherproofing.

Tokyo's Airport Will Be Remodeled to Handle Jets

Tokyo's International Airport will be remodeled to meet demands of jet aircraft, according to plans announced by the Japanese government.

The program calls for reclamation of about 300 acres of off-shore land in Tokyo Bay; construction of a 10,000-ft runway; expansion of the airport's present three-plane berth that would permit accommodation of 11 large planes simultaneously; and construction of three 23,300 sq ft hangers and a 25,900 sq ft storehouse.

The program is expected to be staged over a period running through 1960, the last item to be built being the 10,000-ft runway.

The Low-Down on Low-Bowl Scrapers

A wide, low bowl is important in a scraper, but it takes more than just low-bowl design to give you performance with the best profit factor.

That's why Allis-Chalmers combines this with other equally important features to give you the most efficient scrapers available.

CHECK THIS PROFIT-BUILDING COMBINATION:

1.

Low, wide-bowl design for fast, heaped loading.

2.

Curved bowl bottom and offset cutting edge for faster, easier penetration and live, boiling loads that fill every corner of bowl.

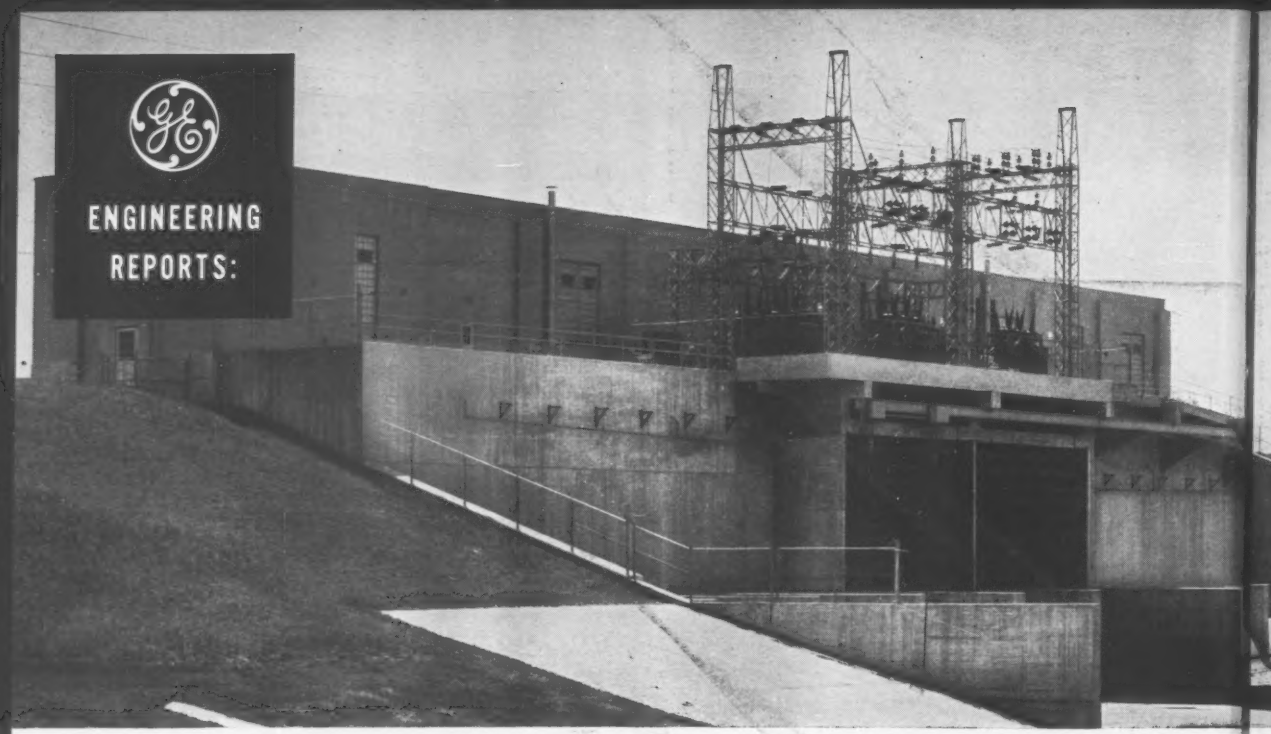
3.

Patented apron-ejector linkage combines high apron lift with positive, forward forced ejection—permits either quick, complete dump or smooth, even spreading.

Your Allis-Chalmers dealer will be glad to discuss these and many other profitable advantages with you. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

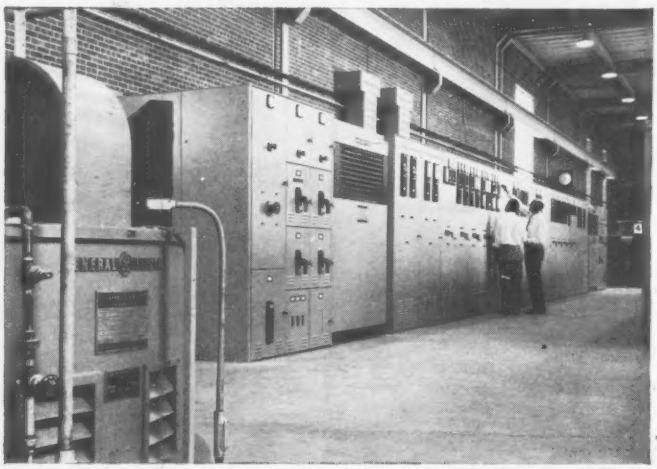
ENGINEERING REPORTS:



NEW BEARGRASS CREEK PUMPING STATION forces flood waters from Creek into Ohio River. Outdoor General Electric substation (center) supplies power to seven Worthington pumps which force 2,167,000 gallons per minute at a 32-foot head. At flood stage, the center gate is closed and surplus water is pumped through syphon into Ohio River at right.

SIX GIANT SYNCHRONOUS MOTORS drive pumps located beneath floor. General Electric engineers designed these 3000-hp motors to provide reliable power for pumps to meet emergencies as they arise.

WORKING OUT DISTRIBUTION PROBLEMS are engineers from Corps of Engineers and G-E Project Engineer. From left, E. E. Pontrich, S. M. Bailey, and W. A. Turner of Corps, and W. O. Lewis of General Electric are shown discussing electrical apparatus at station.



COMPACT, EFFICIENT unit substation brings power close to load, integrates control of related equipment. G-E metal-enclosed low and medium voltage switchgear and transformers help the system meet emergencies.

New Beargrass Creek Project relieves flood threat in Louisville area

General Electric engineered electrical system helps pump flood waters into Ohio River

The rampaging waters of the Ohio River have caused flood damages exceeding $250,000,000 in the Louisville area during the past 15 years. Beargrass Creek, in the City of Louisville, customarily drains the eastern part of the City and then empties into the Ohio. Devastating property losses have been incurred when the Ohio, reaching its flood stage, has backed into Beargrass Creek and flooded the City.

But today the threat of floods in Louisville has been relieved with the completion of the Beargrass Creek project. Flood walls and levees rising 30 feet protect the City, and a new $5 million Beargrass Creek Pumping Station forces surplus water from the Creek into the Ohio when its height reaches dangerous proportions.

IN THE PUMPING STATION, SIX GENERAL ELECTRIC 3000-HP MOTORS drive giant Worthington pumps to force 114-million gallons of water into the Ohio every hour. This water is pumped at a 32-foot head. Reliable power for these motors is provided by a flexible General Electric power distribution and motor control system consisting of unit substations, transformers, switchgear, and circuit breakers.

G-E engineers worked closely with the Corps of Engineers, contractor C. F. Rule Construction Company, and Worthington Corporation to design and install this electrical system capable of protecting against Ohio River floods equal to the record flood of January, 1937.

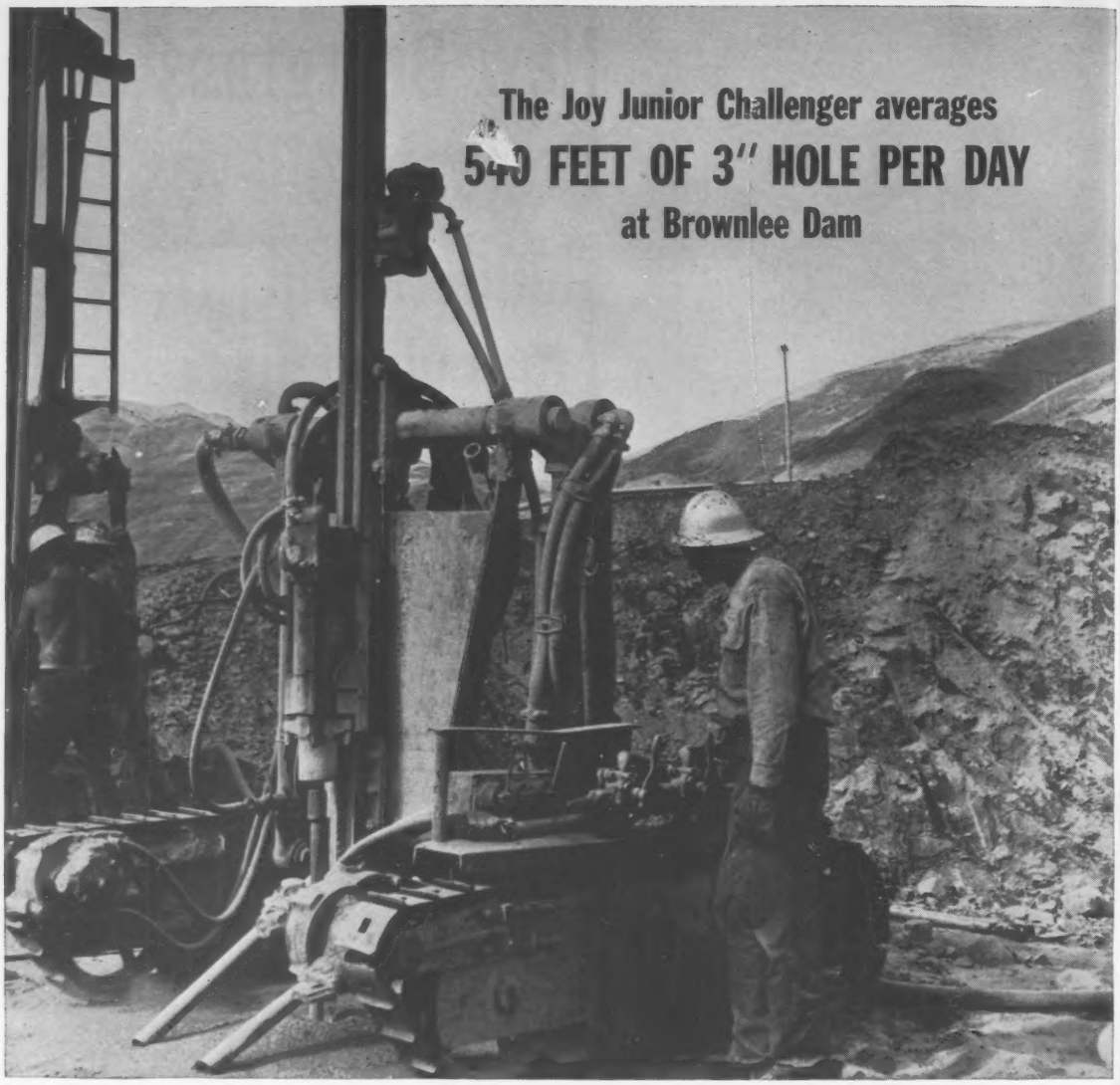
This same complete engineering service and quality equipment is ready to work for you on your construction project. Call on G-E engineers early in your planning when they can be of most value. Contact your nearest G-E Sales Office or write General Electric Company, Section 664-44, Schenectady 5, New York.

*Reg. trade-mark of General Electric Co.

DEPENDABLE TRI-CLAD* motor-generator set supplies excitation power for motors. Ruggedly constructed, it requires little maintenance.

Engineered Electrical Systems for Waterworks

GENERAL ELECTRIC



At a large project like Brownlee dam, a drill has to be versatile . . . move quickly, drill at any angle, have the power and rotation to punch holes through all kinds of formations.

In a 20 hour day, working six days a week, this Joy Junior Challenger has hammered out the average of 540 feet of 3 inch hole per day. This footage includes horizontal holes, vertical holes, and angled holes up to 4 inches in diameter. The drill has moved all over the job, and taken over in locations where other drills were having difficulty with penetration.

If you've got a difficult job coming up, better take a look at the drill that's really versatile, the Joy Junior Challenger. ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

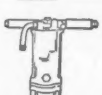
Write for FREE Bulletin 175-24

JOY . . . EQUIPMENT FOR CONSTRUCTION . . . FOR ALL INDUSTRY

PORTABLE COMPRESSORS

WAGON DRILLS

ROCK DRILL BITS


HAND-HELD ROCK DRILLS

MSW C 6022-175

Payment Not Waived

Recovery for work under ambiguous contract

If an owner requires a contractor to perform work not clearly called for by the contract, the contractor, under New York law, may perform the work under protest and later sue for the value of the extra work performed.

Such a situation arose last year on the New York Thruway. It stemmed from a grading contract under which the contractor was directed by the Thruway Authority to remove the trees and stumps. At three other locations, the removal was done under special contract. The contractor in question cited this in support of his contention that he was not required by his contract to undertake such work. At the insistence of the Thruway Authority, he performed what he considered to be extra work under protest.

After the contract was completed, the contractor brought an action to recover for the fair and reasonable value of the work.[1]

The court stated: "The intention of the parties must be found in the language used to express such intention. Hartigan v. Casualty Co. of America, 227 N.Y. 175, 124 N.E. 789. In construing the contract and contract papers before us, the same rules of construction are applicable as between individuals, Jackson v. State of New York, 210 App. Div. 115, 205 N.Y.S. 658, affirmed 241 N.Y. 563, 150 N.E. 556; People ex rel. Graves v. Sohmer, 207 N.Y. 450, 101 N.E. 164, reargument denied 280 N.Y. 581, 101 N.E. 1117, and cases cited therein; and since the contract was drawn by the State of New York, if the language used is capable of more than one construction, the court must resolve all doubts against the person who uses the language and most beneficially to the promisee. Gillet v. Bank of America, 160 N.Y. 549, 555, 55 N.E. 292, 293. If the Court finds as a matter of law that the contract is ambiguous, evidence of the intenion and acts of the parties plays no part in the decision of the case. Plain and unambiguous words and undisputed facts leave no question of construction except for the Court. The conduct of the parties may fix a meaning to words of doubtful import. It may not change the terms of the contract. Brainard v. New York Central R. Co., 242 N.Y. 125, 151 N.E. 152, 45 A.L.R. 751; Restatement of the Law of Contracts, Section 235 (e).

"It is a well-settled rule of law that the practical construction which the parties give to a contract is of great weight in determining what the agreement really is. Stewart v. Barber, 182 Misc. 91, 43 N.Y.S. 2d 560; Woolsey v. Funke, 121 N.Y. 87, 24 N.E. 191; Carthage Tissue Paper Mills v. Village of Carthage, 200 N.Y. 1, 93 N.E. 60."

The court further stated: "The recovery sought herein is on the theory of breach of contract by the Authority, a theory chosen by claimant because it was unjustifiably required to remove the trees in spite of its protests. We think that claimant did not waive any right for said breach by proceeding with its work under protest, and that it is entitled to recover on that theory. Borough Construction Co. v. City of New York, 200 N.Y. 149, 157, 93 N.E. 480, 483. The question whether the removal of the trees required by claimant is embraced within the contract is fairly debatable, and its determination surrounded by doubt; and the Borough Construction Co. case is authority for the general rule that where a municipal representative, without collusion and against the contractor's opposition, requires the latter to do something as covered by the contract, and the question whether the thing required is embraced within the contract is fairly debatable and its determination surrounded by doubt, the contractor may comply with the demand under protest and subsequently recover damages even if it turns out that he was right and that the thing was not covered by the contract.

"It would seem that the removal of the trees was not contemplated by the provisions of the basic contract, and that the Authority breached its basic or main contract with the claimant when it compelled the claimant, over the latter's protest, to do the work as a contract item."

(1) Harnett Company v. New York State Thruway Authority, 155 N.Y.S. 2d 100, Court of Claim of New York, August 2, 1956.

Offer and Acceptance Essential to Contract

A bid constitutes an offer by a contractor. Acceptance of the bid, however, does not lead to a valid contract unless the bid is accepted as submitted.

In a recent Washington case, a school district, which had advertised for bids on a school project, wrote the contractor a letter accepting his bid.

The letter stated the price of the bid that was accepted, but the contract that was submitted to the contractor for him to sign called for certain work not covered by the plans and specifications upon which the bid was based. The contractor refused to execute the contract and brought an action to cancel the bond that was submitted with the bid. The trial court granted the contractor relief and the judgment was affirmed on appeal.[1]

The court indicated that acceptance of an offer must be identical with the terms of the offer and, if it is not, there is no meeting of the minds and no contract exists. An expression of assent that contains changes in the offer in any material respect constitutes a counter offer and does not result in the consummation of a contract.

"For a case very similar to this one, see R. J. Daum Const. Co. v. Child, Utah, 1952, 247 P. 2d 817, wherein it was held that a contractor's proposed written contract with subcontractors, which varied from the subcontractors' previous bid as to a waiver of all claims against the contractor and a $50-a-day penalty for failure to complete the job in a certain time was a counter offer and not an unconditional acceptance of the bid."

(1) Blue Mountain Const. Co. v. Grant County School District, 306 P. 2d 209, Supreme Court of Washington, Jan. 24, 1957.

Substituting Materials Opened Door to Lawsuit

The substitution of materials different from those called for by the specifications may lead to some knotty legal problems. An electrical subcontractor in Massachusetts, for example, exposed himself to a lawsuit when a substitution occurred:

The specifications of an electrical subcontract for construction of a high school called for installation of sound equipment of a certain make and also provided that a different make could be used if approved by the architect.

The specifications called for installation of sound equipment made by Stromberg-Carlson. A supplier of equipment made an offer to install equipment made by RCA which he claimed was as good as that made by Stromberg-Carlson. At the suggestion of the agent of the electrical subcontractor, the agent of the supplier telephoned the elec-

ARKWRIGHT ODDITIES

A clearly discernible word appears in the accompanying figure. Can you find it? See answer below.

Discerning Engineers, Designers and Draftsmen Find Arkwright Tracing Cloths Best for Every Project

BEST FOR FAST, ACCURATE WORK . . . Arkwright's exceptional finish is free of pin holes, coarse threads and other imperfections which cause blobbing and feathering. It assures fast, accurate inking even after repeated erasures.

BEST FOR DURABILITY . . . Continuous quality-control processing assures maximum strength and service life in every roll of Arkwright Tracing Cloth. Its durable finish resists fraying, tearing and curling, while its greater transparency eliminates opacity and brittleness.

BEST FOR FINER REPRODUCTION . . . Made to meet rigid government specifications, Arkwright's exceptional transparency provides the finest reproductive qualities. Whatever the project — whatever the drawing — Arkwright makes every line and letter stand out sharp and clear for easy reading. In the simple drawing shown above, the hidden letters may be easily seen by covering the upper half of the figure.

SEE FOR YOURSELF why Arkwright Tracing Cloths have earned their reputation as "America's Standard". Write for free samples today. Arkwright Finishing Co., Industrial Bank Building, Providence, R. I.

ARKWRIGHT
Tracing Cloths
AMERICA'S STANDARD FOR OVER 35 YEARS

trical engineer on the prime contract and later the agent of the subcontractor talked to the electrical engineer who apparently approved of the use of the RCA equipment, whereupon the electrical contractor gave the supplier an order to furnish and install the RCA equipment.

The supplier ordered all the equipment needed to complete the job and, in accordance with the instructions given by the electrical subcontractor, started to install the equipment. The order stated that it was subject to the approval of the architect. The architect, while he approved the type of equipment used, did not approve its use because a member of the school board objected to such approval. The supplier was then directed to stop the installation and then brought an action to recover damages.

The electrical contractor interposed the defense that the order was given subject to the approval by the architect and that since no such approval was given, no contract existed and therefore it was not liable for breach of contract. The trial court sustained this contention and the action was dismissed. This judgment was overruled by the appellate court[1], that court holding that since the electrical contractor directed the supplier to proceed with the work and since the failure to approve of the equipment resulted from the interference by a member of the school board, the supplier was entitled to recover damages for breach of contract, including the loss of profits he would have made had he been permitted to perform the contract.

(1) Herman Co. v. Gallagher Electrical Co., 138 N.E. 2d 120, Supreme Judicial Court of Mass., No. 13, 1956.

Defective Workmanship And the Burden of Proof

If a contractor claims defects in a job resulted from faulty specifications rather than from his workmanship, he must prove the claim.

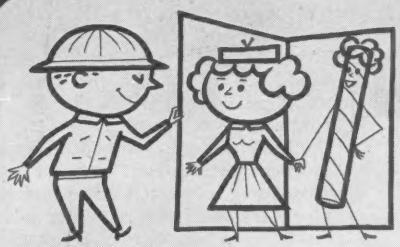
In a Texas case, in which the point was raised, a general contractor sued a painting subcontractor to recover damages for breach of contract. The subcontractor counterclaimed for extra work, claiming he was required to repaint the walls and woodwork in the building. He said the defective work resulted from faulty specifications. The court held that the subcontractor had the burden of proving that the specifications were inadequate.[1]

(1) Wormsbecker v. Donovan Const. Co., 76 N.W. 2d 643.

(*Legal continued on page 72*)

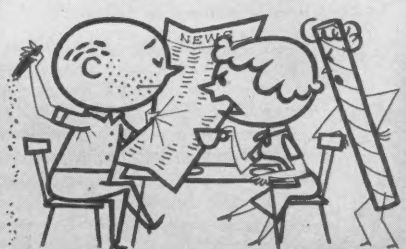
HERE'S A MOVIE FOR POWDER MEN ONLY

"How to handle WOMEN and EXPLOSIVES"



TREAT THEM GENTLY AND WITH RESPECT

PROTECT THEM FROM UNAUTHORIZED PERSONS



OBEY THE DO'S AND DON'TS

to help you blast with greater safety

You'll protect your safety record and gain a smoother, safer blasting operation if you use the new Atlas movie "*How to Handle Women and Explosives*" to help your men observe basic safe practices in their work.

You'll make a deep impression at your next safety meeting with this film which is calculated to bring out amused chuckles and possibly a few guffaws. At the same time it stresses the fact that both women and explosives must be "handled with care" and that both have a list of Do's and Don'ts which must be observed in order to get along with them safely.

Many large operations are using "*How to Handle Women and Explosives*" as a safety meeting kick-off and following with a discussion of the Do's and Don'ts case insert.

The film, complete with a suggested program kit and enough copies of the Do's and Don'ts for your audience, will be sent to you without cost if you write us on your company letterhead, giving the date or dates you plan to use it.

EXPLOSIVES DIVISION
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
offices in principal cities

Reduce Weight . . .

USE SONOCO SONOVOID® FIBRE TUBES to form voids in concrete roof slabs!

Middleville Road High School, Northport, Long Island, N. Y. Ellis Chingos Construction Corp., general contractors. Severud, Elstad & Krueger, structural engineers. Ketcham, Gina & Sharp, architects

Low-cost, easily placed Sonoco SONOVOID® Fibre Tubes *save concrete!*

The circular concrete roof slab for library building on the campus of the Middleville High School weighs less because it contains Sonoco SONOVOID® Fibre Tubes!

This cast-in-place slab requires less concrete and less reinforcing steel because Sonoco SONOVOID® Fibre Tubes displace low-working concrete at the neutral axis.

Voids in concrete construction save materials without impairing structural strength!

Easy to handle, low-cost Sonoco SONOVOID® Fibre Tubes are specifically developed for use in bridge decks, wall, floor, roof and lift slabs; also in concrete piles. For precast units or units cast in place.

Order in sizes from 2.25" O.D. to 36.9" O.D. up to 48' long. Specify lengths to meet your needs or saw to size on the job. End closures available.

See our catalog in Sweet's
For complete information and prices, write

sonoco — SERVES THE WORLD — PAPER CARRIERS
REG. U.S. PAT. OFF.

SONOCO PRODUCTS COMPANY
CONSTRUCTION PRODUCTS DIVISION
HARTSVILLE, S. C.
LOS ANGELES, CAL. 5955 SOUTH WESTERN AVE.
MONTCLAIR, N. J. 14 SOUTH PARK STREET
ATLANTA, GA. • AKRON, IND. • LONGVIEW, TEXAS
BRANTFORD, ONT. • MEXICO, D. F.

Contract Terms Control Recovery for Extra Work

If a written contract exists, a contractor generally cannot rely on a collateral oral agreement to obtain compensation for extra work or to excuse his failure to comply with the contract provisions.

Because of this, a contractor lost out in a Kentucky case where the written contract contained a provision to this effect: If the contractor encounters unforeseen expenses in performing the work, he must submit for the owner's approval a statement of the extra charges before proceeding with the work.

The contractor brought an action against the owner to recover the increased cost of work resulting from unforeseen conditions. The contractor did not comply with the contract provision requiring him to submit to the owner a statement of increased cost before proceeding with the work. The contractor sought to relieve himself of such obligation by contending that the owner had orally promised him that he would see to it that the contractor would not lose money on the job. The contractor was denied a recovery, and the judgment was affirmed on appeal.[1]

The appellate court stated: "In the absence of fraud or mistake, and there is no evidence here of either, a valid written contract merges all prior oral agreements and negotiations." The court held that the failure on the part of the contractor to get the owner's approval of any extra expenses that he may have incurred in the performance of the work, as required by the contract, precluded the contractor from obtaining extra compensation.

(1) Smith v. Ferguson, 295 S.W. 2d 797 Court of Appeals of Kentucky, Nov. 16, 1956.

Preventing Performance Is Breach of Contract

An unjustified refusal by one party to perform his part of a contract relieves the other party of his obligations under the contract.

This type of contract breach has been explained as follows:

" 'Performance by the party not in default is always excused by the wrongful refusal to perform by the other party. The rights of the party in default come to an end, but the contract is, nevertheless, kept in force so as to protect the rights of the innocent party and to enforce the obligations of the delinquent party.' Central Oil Co. of

Los Angeles v. Southern Refining Co., 154 Cal. 165, 167, 197 P. 177.

"'If a party to an obligation gives notice to another, before the latter is in default, that he will not perform the same upon his part and does not retract such notice before the time at which performance upon his part is due, such other party is entitled to enforce the obligation without previously performing or offering to perform any conditions upon his part in favor of the former party.' Section 1440, Civil Code."[1]

Where a party has been prevented from the performance of a contract by the wrongful acts of the other party, he is legally entitled to recover the damages sustained as a result of such wrongful conduct on the part of the other party.

(1) Vineland Homes v. Barish, 292 P. 2d 941.

Measure of Damages For Defective Work

The amount of damages an owner can recover from a contractor for defective work generally depends on the nature and seriousness of the defects.

In Texas, the rule is this:

"If the defects which constituted the breach can be remedied, without impairing the building as a whole, the measure of damages is the reasonable cost of remedying such defects, but if such defects cannot be remedied without injury to the structural efficiency of the building as a whole, the measure is the difference in the value of the building as constructed and its value had it been constructed according to the contract".

In that case, a home owner sued a contractor for breach of a construction contract, claiming that the work performed by the contractor contained a large number of defects and that there was no substantial performance of the contract.

The trial court sustained the owner's contention and granted him a judgment for the amount it would cost to remedy the defects in the work so as to make it conform with what was called for by the plans and specifications. This judgment was affirmed on appeal.[1]

(1) Hutson v. Chambless, 295 S.W. 2d 723, Court of Civil Appeals of Texas, Nov. 8, 1956.

These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.

Speed up construction . . .

USE SONOCO SONOTUBE® FIBRE FORMS for round concrete bridge piers!

Overpass for side roads, New Hampshire Turnpike, Dover, N. H., State of N. H., owner. Landers and Griffin, contractors. Hayden, Harding & Buchanan, engineers. Photo by Zambello.

Low-cost, quick to erect Sonoco SONOTUBE® Fibre Forms *save time!*

Both 36 and 30 inch Sonoco SONOTUBE® Fibre Forms were used to construct the round concrete piers of this highway overpass bridge. Forming for caps tie-in simply with the fibre forms of the supporting piers.

The low-cost Sonoco Fibre Forms erect quickly because they require minimum bracing and handle easily because they are lightweight.

Speed up construction time . . . save money and labor . . . use Sonoco SONOTUBE® Fibre Forms to erect round columns of concrete! Order Sonoco Fibre Forms for your next job . . . sizes from 2" to 48" I.D. up to 48' long. Supplied in specific lengths or can be sawed to size on the job. For finished columns use Sonoco's patented "A-coated" SONOTUBE® . . . wax-coated also available.

See our catalog in Sweet's for complete technical information and prices, write

sonoco — SERVES THE WORLD — 1 PAPER CARRIERS
REG. U.S. PAT. OFF.

SONOCO PRODUCTS COMPANY
CONSTRUCTION PRODUCTS DIVISION
HARTSVILLE, S. C.
LOS ANGELES, CAL. 5955 SOUTH WESTERN AVE.
MONTCLAIR, N. J. 14 SOUTH PARK STREET
ATLANTA, GA. • AKRON, IND. • LONGVIEW, TEXAS
BRANTFORD, ONT. • MEXICO, D. F.

Extra Large Pretensioned Concrete Girders Produced At Speed Of One A Day!

Tufwire strands for four girders were pretensioned. Forms were set, reinforcing steel plac

Mammoth Spans Pretensioned With Union **Tufwire** Strand Add Proof of Prestressed Concrete's Ever-Widening Adaptabilit

Ordered for the construction of a new triple super phosphate storage warehouse, each of these giant girders is 101 ft. 6 in. long, with a height of 12 ft. at the center, tapering to 4 ft. at the ends. They were cast by Prestressed Concrete, Inc., Lakeland, Fla., in a double bed, 422 ft. long. In the prestressing, a total of 48-7/16 in. Union Tufwire Stress-Relieved Strands were stretched in the bed in two rows—four girders to each row.

In this project, two of the many advantages which the Prestressed Concrete Industry has to offer, have been convincingly demonstrated. Both are of vital importance to the construction industry.

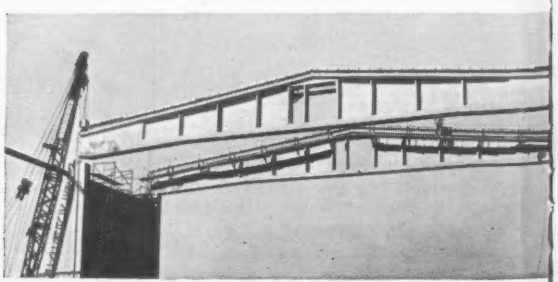
1st. Design and fabrication limits of Prestressed Concrete are far from being reached.

2nd. The speed with which Prestressed Concrete sec tions are produced eliminates construction de lays by by-passing materials in short supply, o on extended backlog delivery.

Architects and engineers are finding prestressed appli cations virtually unlimited. Prestressed component serve as foundations, floors, columns, beams, slabs walls and roofs. For highway bridges, prestressed concrete is fast becoming standard design in many areas For example, the state of Florida and its Turnpike Authority have standardized on prestressed concrete bridges. Girders or deck sections can often be mass-produced quickly and erected in less time than is required to install false work.

Rolling to the job: Giant 70-ton girder on the way to the site of chemical storage warehouse being built at Brewster, Fla.

Up she goes! One girder has been placed in the structure, another i being positioned, and a third is on the ground ready for hoisting.



and the concrete cast progressively from one end of the casting bed to the other.

Union **TUFWIRE** Strand Used 100% In These Girders

As long time specialists in high carbon wire, the Union Wire Rope organization stepped sure-footedly into pioneering the technological development of stress relieved, high tensile wire and strand for prestressing concrete. Just as sure-footedly it has expanded research and production facilities to keep well ahead of the demands of the 300% yearly growth of the prestressed concrete industry.

We're geared to the needs of this amazing prestressed concrete industry—and geared for its future growth.

Today we're supplying Tufwire Stress-Relieved Wire and Strand to projects ranging from the largest in history's biggest highway building program . . . right on down to poles and farmers' fence posts. The orders don't come too big or too small. You can be sure of prompt delivery from our strategic Mid-America location.

Have a problem? Whether you're already an on-site contractor or a permanent casting-bed operator—or are exploring the potential of prestressed concrete in your area —get in touch with our engineering department and research laboratories.

Would you like to have a reprint of a recent Tufwire advertisement which has been called "a primer of the prestressed concrete industry"? It distills the whole big story of prestressed advantages into 10 minutes of thought-provoking reading. It is a summary of fundamental facts supplied by a panel of prestressed fabricators and consultants who pioneered in the industry and have grown with it. Write for your copy today!

Small buildings, too, share the advantages and economies of prestressed concrete construction. This eye appealing shelter house in a park will minimize vandalism and be remarkably easy on maintenance costs. Compare the speed and facility of erection when structural members are mass-produced and delivered complete instead of laboriously being cast on the site.

UNION Tufwire Is Protected Against Rust and Corrosion

All shipments of Tufwire Strand are safeguarded against corrosive effects of dampness, salt air and damaging fumes. Another big Tufwire "plus"!

union

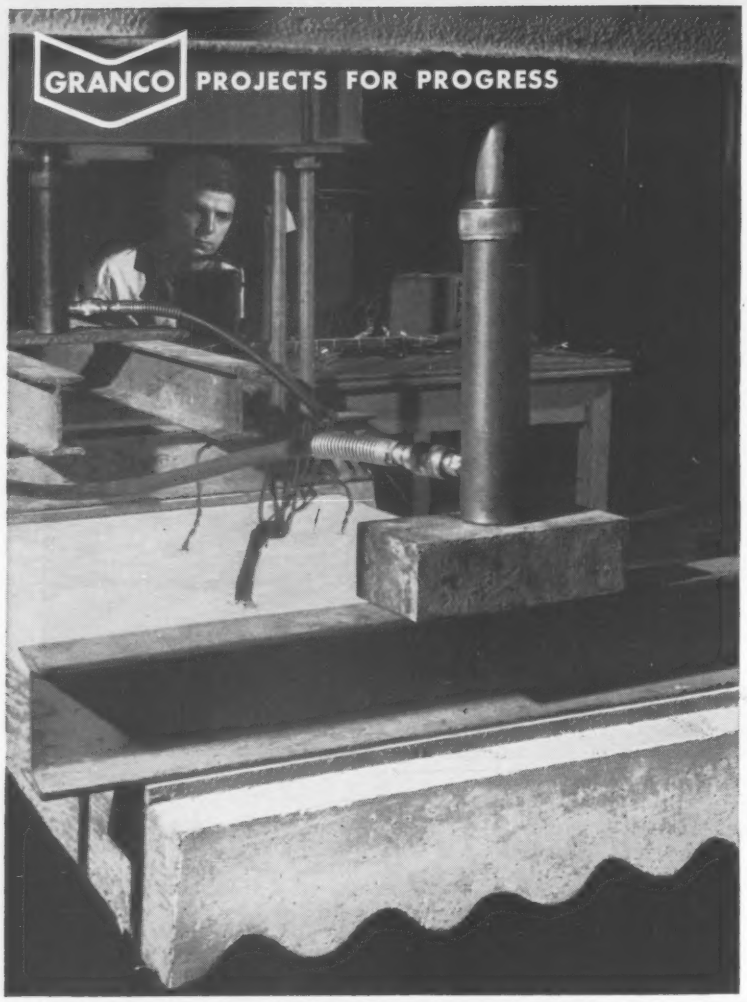
Tufwire

Stress-Relieved Wire & Strand

union Wire Rope corp.

Specialists in high carbon wire, wire rope, braided wire fabric, stress-relieved wire and strand.

2228 Manchester Avenue Kansas City 26, Missouri



"CARDIOGRAPH" FOR A CONCRETE SLAB

Sensitive stress-measuring device proves strength of new E-R Cofar floor system, . . . helps speed better products to you.

Operating like a cardiograph that records the strength of a human heart, the 50 strain gages buried in the concrete slab, above, measure the amount, location and direction of stresses that result when loads are applied to the slab. This precision device is one of many experimental rigs used by the research laboratory at Granco Steel Products Company. This laboratory develops better Granco products for the construction industry and provides data that enables architects and engineers to use these products with *predictable* results. Here, we're testing the strength of an E-R ("Electrically Ready") Cofar reinforced-concrete floor system in which cellular steel units are used to provide wiring raceways.

Like to see the results of this test? We'll be happy to send them to you, absolutely free, if you'll drop us a card today. This is the story of Granco product research . . . the right road to progress.

GRANCO® STEEL PRODUCTS COMPANY
6506 N. Broadway, St. Louis 15, Missouri
***A Subsidiary of* GRANITE CITY STEEL CO.**
Distributors in 80 Principal Cities

GRANCO — SINCE 1878 GRANITE CITY STEEL

Books

Reclamation Project

IRRIGATION ENGINEERING, VOLUME II, PROJECTS, CONDUITS AND STRUCTURES—By Ivan E. Houk, 531 pp., John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. $14.00.

Volume I of this two volume set concerns itself with agricultural and hydrological aspects of the irrigation problem. This companion volume gets down in a very practical manner to the design and construction of irrigation facilities.

Chapters run the gamut from diversion and storage dams to conduits and structures needed in conveyance and distribution systems. Each chapter includes both general discussions of the chapter subject and description and analyzation of actual existing structures. Detailed drawings, graphs and diagrams are included along with photographs. Bibliographies at the end of each chapter and a detailed name and subject index provide good mechanical aids.

British Road Primer

PRACTICAL ROAD CONSTRUCTION—By J. H. Arnison, 156 pp., St. Martin's Press Inc., 103 Park Ave., New York, N. Y. $3.75

This book is primarily a general review on road planning, construction and maintenance, published by Edward Arnold, Ltd., London. It was prepared for those taking trades course examinations, especially those for street mason and pavers given by the City and Guilds of London Institute.

Since the volume is concerned with elementary British practice, little new is added to road construction methods as recognized in the United States.

Miscellaneous Notes

• **Information on Large Dams**—The Transactions of the Fifth Congress on Large Dams, held in Paris in 1955, now are available for purchase from the Secretary, U. S. Committee on Large Dams, 29 W. 39th St., New York 18, N. Y. They consist of four volumes, containing in total some 3,500 words. The cost is $60 a set to non members of the U. S. Committee and $48 to members. The volumes are not sold separately.

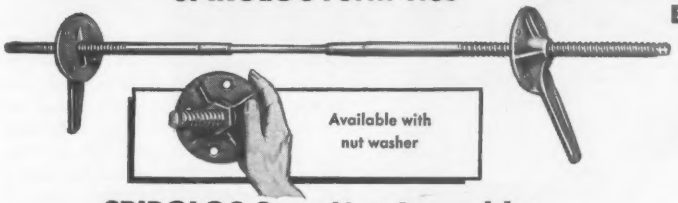
• **Prestressed bridge cost data**—Construction cost data and descriptions of prestressed concrete bridges in five East Coast states and California are given in four papers contained in a 34 page

UNIVERSAL FORM TIES

a Complete Line From 1 Source

SPIROLOC Form Ties

Faster Erection . . . Positive Holding . . . Easier Stripping



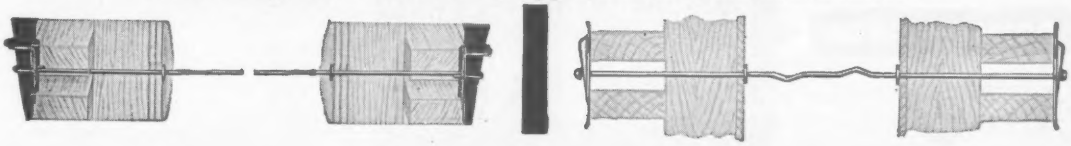
- Greater tie strength for heavy construction
- Fewer ties per sq. ft. of form area. LOWER MATERIAL and LABOR COSTS
- Positive breakbacks
- Permanent, reuseable equipment
- RENTED . . . SOLD

SPIROLOC Cone Nut Assembly

The most positive internal spreader and form tie

TWISTYES | SNAP TIES

Positive Spreader Ties for all types of Concrete Construction



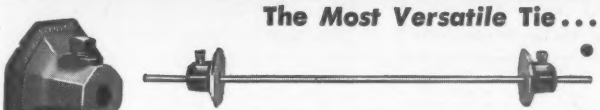
Combination wedge and bearing plate . . . easy application . . . won't twist or fall off —ample take-up.

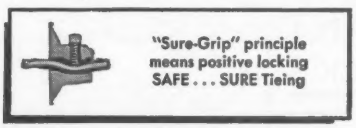
- Low cost ties for job-built or prefabricated forms
- Used with or without walers
- Accurate breakback . . . minimum plug required
- Choice of Spreader Washer . . . 7/8" flat is standard
- Rugged Twistye and Snap Tie Clamps have extra bearing surface . . . additional safety factor

Curved ends speed installation and stripping . . . long slope wedge for ample take-up. Extra nail holes permit nailing clamp in any position.

FORM CLAMPS

The *Most Versatile* Tie . . . At the Lowest Cost





- 2 Form clamps and a mild steel rod make a tie to handle any condition
- Wide clamp base gives more bearing on waler . . . won't "bite" at maximum loads
- Notched base permits nailing to waler

UNIVERSAL FORM CLAMP CO.

GENERAL OFFICES AND FACTORY: 1238 N. KOSTNER • CHICAGO 51, ILLINOIS

OFFICES AND WAREHOUSES:
CLEVELAND, OHIO, 24901 Lakeland Blvd. • BALTIMORE, MD., 1020 N. Kresson St.
HOUSTON, TEXAS, 2314 Preston Ave. • SAN LEANDRO, CALIF., 2051-9 Williams St.
LOS ANGELES, CALIF., 5855 South Western Ave. • ATLANTA, GA., 1401 Howell Mill Rd.
DISTRIBUTORS IN PRINCIPAL CITIES

Service Wherever You Build . . . Coast to Coast

Copyright 1955 by UNIVERSAL FORM CLAMP CO., Chicago 51, Ill.

PRIME-MOVER M30 FOR ENGINEERED CONSTRUCTION Hauls 2/3 yard or 1-1/2 tons. Unloads transit mixers fast. Spots concrete right where it's needed on plant, warehouse, pier and bridge construction. Hydraulic Torque Converter Drive frees the operator from shifting, clutching and wasted effort. Rugged, dependable. Bucket and flat bed interchangeable.

M30
PRIME-MOVER
M15A

FOR HIGH VOLUME, LOW COST PLACING OF CONCRETE AND OTHER BULK MATERIALS— USE PRIME-MOVER POWER!

PRIME-MOVER M15A FOR BUILDING CONSTRUCTION

The established method of placing materials on school, hospital, and commercial building projects. Places 12 to 17 cu. yds. of concrete per hour — *without* extensive preparation for its use. Runs on same type of ramps, hoists and runways as hand carts. Available with flatbed, or 10 cu. ft. bucket.

FOR COMPLETE DETAIILS WRITE TO PRIME-MOVER CO., MUSCATINE, IOWA

DUDGEON HYDRAULIC JACKS

SALES RENTALS

CAPACITY TO 600 TONS

FOR:
PILE TESTING
UNDER-PINNING
BRIDGES
PIPE PUSHING
SOIL TESTING

Write to Dept. R

RICHARD DUDGEON INC.

789 BERGEN ST. • ST 9-4040 • BROOKLYN, N. Y.

The BELMONT IRON WORKS

Engineers — Fabricators — Erectors
Contractors — Exporters
Cable address—Belliron

STRUCTURAL STEEL
BUILDINGS & BRIDGES
RIVETED — ARC WELDED

Shops: Eddystone, Pa.—Philadelphia, Pa. Royersford, Pa.

22nd St. & Washington Ave. Philadelphia 46, Pa. Main Office

New York Office 44 Whitehall St., N. Y. 4, N. Y.

bulletin issued by the Highway Research Board. The papers report design and cost information on both post-tensioned and pretensioned simple spans, give comparisons between prestressed and conventionally reinforced bridges and discuss bridges made of post-tensioned, I-shaped girders, 58 to 67 ft long. Bulletin 144, Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. Cost, 80 cents.

Engineer on foreign policy—A new book "Waging Peace" has the subtitle, "A Businessman Looks at United States Foreign Policy", but "consulting civil engineer" could have been substituted for "businessman" since the author is C. Maxwell Stanley, president, Stanley Engineering Co., Muscatine, Iowa.

Stating that "I am unwilling to accept the adage that there will always be wars," Mr. Stanley develops a seven-point program for "waging peace", which includes aid to underdeveloped nations and a strengthening of the United Nations Organization.

The book is published by the Macmillan Co., New York. Price $4.50.

Plastic pipe—The U. S. Department of Commerce has issued a revised commercial standard of flexible polyethylene plastic pipe.

One of the major revisions is the new requirement that all pipes shall meet specifications of the National Sanitation Foundation. The new standard was developed with the cooperation of the Polyethylene Pipe Standards Committee of The Society of the Plastics Industry.

For copies of the standard, write to Superintendent of Documents, U. S. Government Printing Office, Washington 5, D. C., for GS 197-57. Price is 10 cents a copy.

Deep Well Pumps—An outstanding 72 page publication devoted to vertical turbine pumps is available. Replete with numerous graphs and tables, the book covers selection of deep well pumps plus subsidiary topics as designing for small cities, meeting corrosion problems, column life and vertical short-coupled turbine pumps. Many case studies are presented. The book was written by Axel O. Fabrin, chief engineer of Layne & Bowler, Inc., Memphis, and one of the country's leading deep well pump authorities, and is available from L&B.

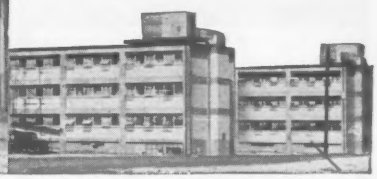
REQUIREMENTS FOR WATER FOR USE IN MIXING OR CURING CONCRETE—Technical Report No. 6-440, 50 cents. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

MASONITE

Concrete Form

PRESDWOOD

Nine EM Barracks Buildings, El Paso, Texas.
Architects: Davis & Foster, El Paso.
Contractor: Lowell & Ponder.
Concrete Slab Form Work by: The Hausman Steel Company, Toledo, Ohio.

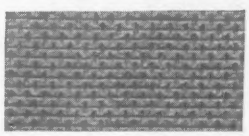


Blemish-free Concrete—time after time!

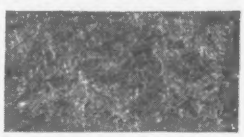
Confronted with a "hurry-up" schedule, the contractor on this job kept on using forms faced with the same Masonite® Concrete Form Presdwood®... and kept on getting the same smooth-surfaced architectural concrete.

They can be used time and again, these smooth, grainless panels. And repeated uses will save you material and forming costs. They won't split, splinter or crack. They can be bent to form arches and columns. The large panels (3/16" and 1/4" thick) are easily cut and worked, using ordinary carpentry tools.

There are two sides to this story



Screen side to concrete. Cuts hand-rubbing time. Provides ideal bond for painting concrete surfaces.



Smooth side to concrete. For blemish-free concrete surfaces. Hand rubbing is virtually eliminated.

® Masonite Corporation—manufacturer of quality panel products

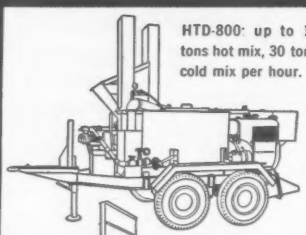
MASONITE® PRODUCTS

MASONITE CORPORATION
Dept. ENR-5-30, 111 Sutter St., San Francisco 4, Calif.
Please send me a sample of Concrete Form Presdwood and your booklet on cutting costs.

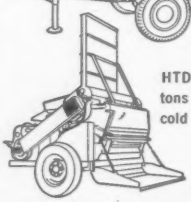
Name.....
Firm.....
Address.....
City.....*State*.....
Zone.....*County*.....

For Low Cost Paving or Patching

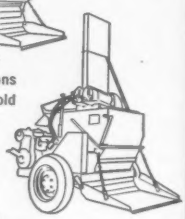
McConnaughay ASPHALT MIXERS



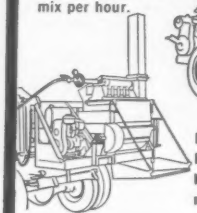
HTD-800: up to 10 tons hot mix, 30 tons cold mix per hour.



HTD-500: up to 7 tons hot mix, 15 tons cold mix per hour.



HTD-B: up to 5 tons hot mix, 10 tons cold mix per hour.

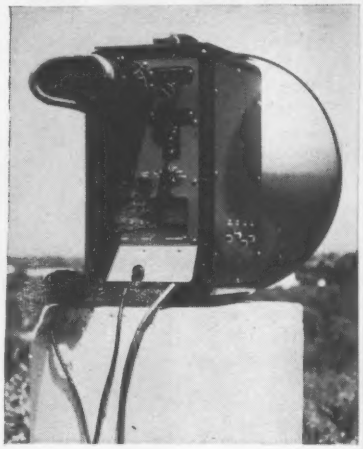


HTD-B TRUCK MOUNT: up to 5 tons hot mix, 10 tons cold mix per hour.

For details and specifications, write, wire or 'phone . .

K. E. McCONNAUGHAY
LAFAYETTE, INDIANA

National distributors: Asphalt Equipment Co., Inc., 3314 Cherry Lane, Fort Wayne, Indiana



SURVEYORS' NEWEST TOOL measures travel time of radio waves with accuracies as good as 1 in 868,000 over 12 mi distance.

Microwave Radio System Used For Long Distance Measurement

Surveying's newest tool, a microwave radio system for distance measurement, was described in detail last month (April) by its developer before England's Royal Geographical Society in London.

Known as the tellurometer system, it measures the travel time of radio waves between transmitter-receiver stations in a manner similar to radar. Accuracies obtained over distances between 500 ft and 30 mi far exceed first order work, as shown in the graph.

Proved out by T. L. Wadley under the aegis of the National Telecommunications Research Laboratory of the South African Council for Scientific and Industrial Research, the microwave system was developed to replace existing methods of taping a geodetic base. It also provides a means of trilateration to replace triangulation in conditions of poor visibility or in difficult country where elaborate towers would be required.

• **Other applications**—Mr. Wadley forsees the instrument as valuable for control in aerial surveying and in coastal traversing for hydrographic purposes. At ranges less than 1,000 ft, it is not likely that sufficient accuracy or convenience, as compared to taping, could be achieved. But there is good possibility of its being competitive with simple taping above this distance, particularly where angular measurement required in triangulation is difficult or impossible.

Mr. Wadley reported that with the radio system, observations can be made satisfactorily through haze, mist and smoke and even light rain. Natural sources of interference with the 10 cm wavelength employed are negligible. Alignment of radio beams need be only very approximate and operation from a simple tower is practical.

The instruments measure slope distance, which are reduced to horizontal by utilizing barometric height differences. Use of microwave overcomes errors due to stray reflections that would be encountered by longer radio waves. Another often cited objection, that velocity of radio waves is adversely influenced by humidity, was found to be of small consequence. Meteorological limitations are due mainly to temperature uncertainties, believes Mr. Wadley.

• **Operation**—Observations are made at the master station, while an operator at the remote station accomplishes various switching arrangements on instruction from the master observer via a two-way radio-telephone circuit. Each transmitter-receiver with its parabolic shaped aerial system weighs 16 lb. A power supply unit also weighs 16 lb. An aneroid barometer and whirling hygrometer for determining meteorological conditions completes the equip-

Wire Rope at Work—In constructing a portion of New Jersey's North-South Freeway, Route 42, the builders were faced with a difficult drainage problem. In boglands near Philadelphia, it was necessary to drive sand drains into the earth, then place cross-drains near the surface and top everything with overburden. The weight of this top layer "squeezed" the bog and forced water up the sand columns and into the cross-drains.

Hercules Concrete Pile Co. contracted to install 500,000 lineal ft of drainage system. The photograph above shows one important phase of the work—filling a casing with sand. The task of ramming the casings into the ground was handled by hard-hitting pile-drivers. To lift the bulky rams for every stroke, the rigs were fitted with Bethlehem Purple Strand—a wire rope so tough that it stood up easily under the merciless demands of the job.

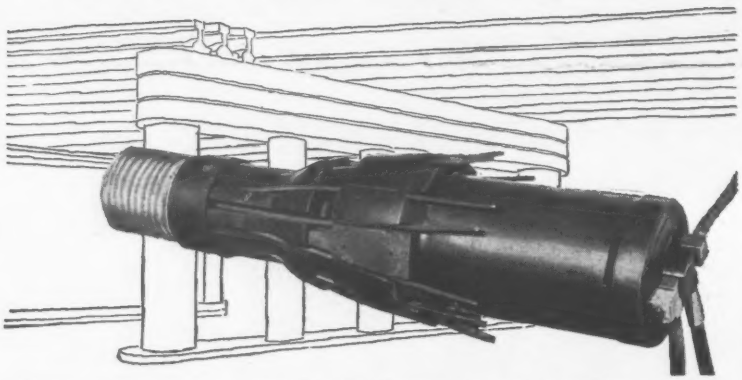
Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

CONTRACTORS

—are you getting your share of PRESTRESSED BRIDGE JOBS?



Here's good news for contractors bidding on the ever-increasing number of prestressed concrete bridge jobs throughout the country! From a single supplier—The Intercontinental Equipment Co., Inc.—now you can get the full line of Freyssinet-engineered material and equipment for prestressing. This means top quality, competitive pricing, and immediate delivery of products developed by the most famous name in its field.

Here are the basic units you'll need for your next prestressed bridge job:

ANCHORAGE UNITS	TENSIONING JACKS	GROUT MIXER
CABLE ASSEMBLIES	HYDRAULIC PUMP	GROUT PUMP

With these products available, every contractor can bid on any prestressed structure with convenience and assurance of lower cost.

So, for full details and a free copy of your products catalogue, write, wire, or telephone now to

INTERCONTINENTAL EQUIPMENT CO., INC.

Prestressed Concrete Division

120 Broadway, New York 5, N. Y.

Member Prestressed Concrete Institute

GUNITE

Since 1915

CONCRETE

SAND AND CEMENT

"Placed by Air"

We have the equipment, personnel and experience to complete any and all GUNITE work regardless of size or location.

Send for specifications and bulletins

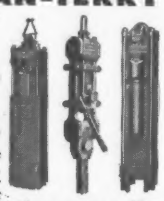
GUNITE CONCRETE & CONST. CO.

1301 WOODSWETHER RD., KANSAS CITY 5, MO.
2016 WEST WALNUT, CHICAGO 12, ILLINOIS
3206 HOUSTON, HOUSTON 9, TEXAS
1508 PARKWAY DRIVE, ST. LOUIS 4, MO.
Milwaukee and Twin Cities—Denver—New Orleans

McKIERNAN-TERRY

WIDE-RANGE LINE OF

PILE HAMMERS AND EXTRACTORS



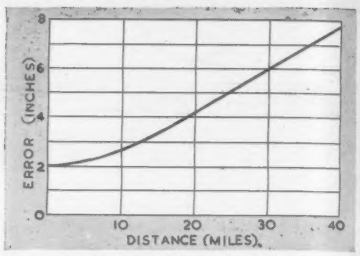
Now made in complete standardized line of 11 double-acting hammers, 5 single-acting hammers and 2 double-acting extractors. Also Sand Drain Equipment and Steam Generators.

Write for free descriptive bulletins.

Also builders of coal and ore bridges and unloaders, and specially designed machinery.

McKIERNAN-TERRY CORP.

32 Marcer Street, Dover, N. J.



ESTIMATED PROBOBLE ERROR of new microwave radio distance measurement system is 2 in. plus 3 ppm.

ment package required at each station.

The master station emits a continuous radio wave whose frequency is modulated (changed) to various pattern frequencies that correspond to different distance ranges. In effect, these waves bounce off the remote station. The wave as received back at the master station is compared with the transmitted wave on an oscilloscope that indicates transit time, which can be converted to distance. Each of the pattern frequencies results in an oscilloscope reading of different range, something like the sweep dials of an ordinary household electricity meter. Smallest scale divisions correspond then to 6 in., 60 in., 600 in. and 6,000 in. (there are four modulating frequencies); full scale ranges are 50, 500, 5,000 and 50,000 ft.

Oscilloscope readings in millimicroseconds are corrected for temperature, vapor pressure and barometric pressure, then converted to distance by multiplying by velocity of the waves.

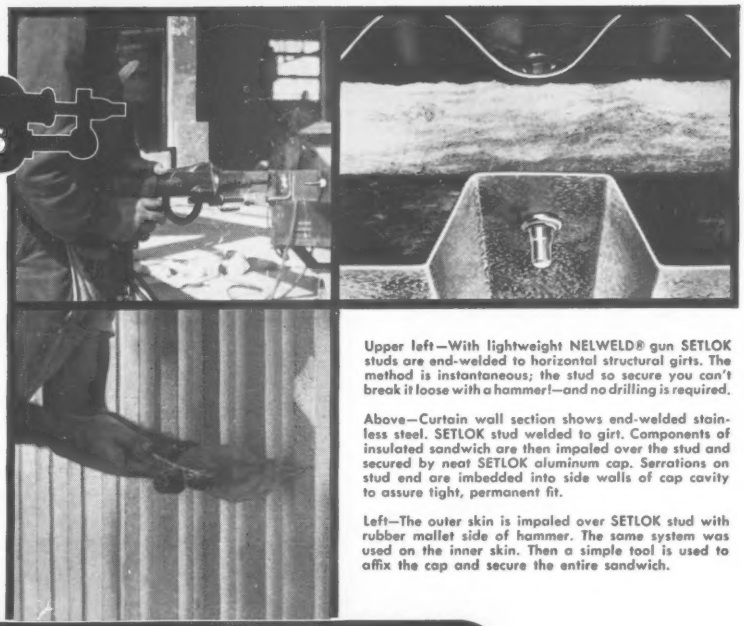
• **Field tests**—In proving out the microwave system, three triangulation nets were measured, at Kroonstad, Johannesburg and Mtubatuba in South Africa. In the Kroonstad baseline, about 12 miles long, probable error estimated by the South African Department of Trigonometrical Survey was 1 in 868,000. Estimated probable error in length of individual sides of the base extension figure was given as 2 parts per million.

Based on the field tests, Mr. Wadley stated accuracy of the radio instrument as 2 in. plus 3 ppm, as indicated in the graph. The constant 2 in. is instrumental error for an average observer; the 3 ppm arises from meteorological limitations. The inventor believes the main source of such error are temperature readings that are not truly representative of the path.

The tellurometer system is being marketed by Cooke, Troughton & Simms of the Vickers group in England. Arrangements are under way for its introduction in the U. S.

INDUSTRIAL SANDWICH WALLS

Handsome, efficient, and economical, insulated aluminum curtain wall is field assembled fast when NELSON SETLOK® studs are used to secure the sandwich to the structural girts. This NELSON development is now widely accepted by architects and engineers. It typifies the NELWELD approach to new construction techniques. It supplies the need, as do so many other specially engineered NELSON studs, for fast, safe, secure, low-cost fastening.



Upper left—With lightweight NELWELD® gun SETLOK studs are end-welded to horizontal structural girts. The method is instantaneous; the stud so secure you can't break it loose with a hammer!—and no drilling is required.

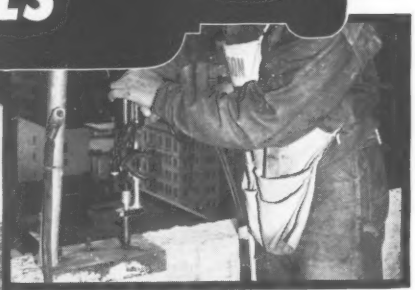
Above—Curtain wall section shows end-welded stainless steel. SETLOK stud welded to girt. Components of insulated sandwich are then impaled over the stud and secured by neat SETLOK aluminum cap. Serrations on stud end are imbedded into side walls of cap cavity to assure tight, permanent fit.

Left—The outer skin is impaled over SETLOK stud with rubber mallet side of hammer. The same system was used on the inner skin. Then a simple tool is used to affix the cap and secure the entire sandwich.

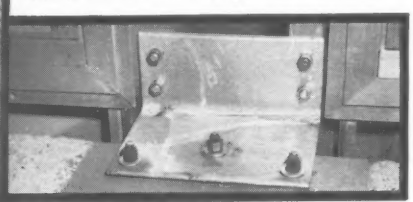
NELSON®... the best way to fasten ALL CURTAIN WALLS

ARCHITECTURAL CURTAIN WALLS

Perfect alignment of window-wall panels is positive when the NELWELD method is used. Threaded studs are end-welded to channel inserts at the time the panels are erected, assuring accurate positioning of the angle clips with respective relation to the walls and inserts. The system simplifies the design and greatly reduces installation costs. The building illustrated—Equitable Life, San Francisco. Architects: W. D. Pengh and Loubet & Glynn. Contractors: Dinwiddie Construction Co. Window Installers: Kawneer Co.



Portable, lightweight NELWELD gun in operation end-welding studs to channel inserts. Simple template is used to locate studs accurately.



Close-up of angle clip after assembly. Holes in clips are slotted to provide for adjustment.

Left—Lower portion of building shows window wall sections in place.

NELSON STUD WELDING
Division of Gregory Industries, Inc.
LORAIN, OHIO

NELWELD®

Please send more complete information on the NELWELD method of securing:
☐ INDUSTRIAL CURTAIN WALL ☐ WINDOW WALLS

Name_____

Company_____

Address_____

City_____ Zone____ State____

Roebling covers the distance ...with aerial tramways of any length

Illustrated here is a Monocable Tramway erected by Roebling for the Cerro de Pasco Copper Corporation in Peru. It has a capacity of 50 tons per hour, is 10 miles long and rises to an elevation of 15,000 feet.

It is another of the direct descendants of the genius of John A. Roebling who, in 1841, made America's first wire rope. From wire rope came the modern suspension system, a category whose width includes such diversified structures as antenna systems, ski and chair lifts, suspended roofs, pipeline bridges and bridges from the "George Washington" size to those that carry plant personnel, school children, pedestrians and material from one point to another.

Roebling is a specialist in wire rope suspension systems of every description—and Aerial Tramways is one of them. There is no physical maximum or minimum limit to the distance over which Roebling Aerial Tramways can transport materials. The proper length is determined by an economic study. Here again is proof that flexibility of application is a prime characteristic of the suspension system and the names it goes by. Your materials, your problems, your location, your distances and costs come first—the system is adapted to fit *them*.

The experience, knowledge and facilities that are applied to your materials-handling problem when you come to Roebling are incomparable. Feel free, at any time, to call on us. Any information you want can be had by writing to Bridge Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

Maine Water Line with Section Through Swamp

This $145,186 contract to R. H. White Construction Co., Inc., Auburn, Mass., covers laying a 24,000 lin ft of cast iron water main in streets, cross country and through a swamp. Pipe is furnished by the York Water District, Me. This contract beats the nearest competitor by 2.4% and the engineer's estimate by 9.3%. Camp, Dresser & McKee, Boston, are the consulting engineers.

The 16 in. main line includes a 3,200 ft cross country section in a wooded area with a 600 ft swamp where pipe must be laid on cypress mats. The minimum cover on the pipe is 2 ft in the cross country section and 4 ft in streets.

Pipe installation, priced $2.00 per lin ft of 6 in. and 10 in. pipe (bell and spigot) and $2.40 for 16 in. pipe (mechanical joints), includes an allowance for paving that will be done by the Town of York or by the State of Maine.

Prevailing wage rates are $1.50 for unskilled labor and $2.85 to $3.25 for equipment operators.

The job drew 19 bids. The 11 low bidders included:

1C R. H. White Constr. Co., Inc., Auburn, Mass.	$145,186
2 A. D'Alessandro Sons, Co., Hyde Park, Mass.	143,710
11 Henry J Ruch, York Village, Maine	174,602
EE Camp, Dresser & McKee, Boston, Mass.	169,000

Bids: 3-6-57 Items	Unit	Quantity	Unit Prices 1C	2
CIP, mech jt, 16"	lf	21,933	$2.40	$2.65
b & s, 10"	lf	1,740	2.00	1.65
6"	lf	350	2.00	5.00
Fittings, b & s, CI	lb	45,890	0.02	0.10
Hub-end valve & box, 16"	ea	17	20.00	40.00
10"	ea	1	12.00	15.00
6"	ea	44	6.00	10.00
T S & valve, 12x12"	ea	1	100.00	225.00
12x10"	ea	1	100.00	225.00
10x10"	ea	1	100.00	225.00
Hydrants	ea	37	50.00	50.00
Air release valve	ea	1	55.00	200.00
Air vents	ea	7	65.00	75.00
Manhole, concrete block	vf	35	60.00	20.00
Extra for swamp crossing	lf	job	6,000	20,500
Excavation, rock	cy	4,900	10.00	8.00
boulder	cy	250	10.00	8.00
Earth fill	cy	1,000	2.00	1.00
Gravel fill	cy	3,800	2.25	3.00
Misc & cleaning up	ls	job	14,000	2,200

Work started: 4-1-57
To be completed: 9-30-57

Highway in Colorado Includes Structures

For $181,963, this 1.12 mile stabilized plant-mix highway includes a bridge over San Miguel River. Work is complicated by the proximity of the old structure that cannot be removed before the new bridge is open for traffic. The contractor has to haul his material 50 miles from the nearest railhead.

This new section on State Highway No. 97 for the Colorado Department of Highways, Denver, is between Nuturita and Nucla in Montrose County. Mark U. Watrous is chief engineer of the Department and J. L. Hutchinson, Durango, Colo., is the consulting engineer.

Hoyle and Elbert Lowdermilk Inc., Englewood, Colo., took the contract with their low bid of $0.68 per cu yd on 79,000 cu yds of unclassified excavation which drew bids up to $1.40 from the competition of six bidders. This brought their total down to 15.2% below the second low bid and 7.3% below the engineer's estimate.

Class A concrete is priced $85 per cu yd as compared to $70 to $89 bid by the competition. It must contain six bags of cement per cu yd and test at 3,000 lb psi.

Uranium activities in this area have effected competition on the labor market. Union wage rates are $2.80 for skilled labor, $2.45 for semi-skilled and $2.10 for unskilled labor.

Bidders on this Colorado highway project include:

1C H. & E. Lowdermilk, Inc., Englewood, Colo.	$181,963
2 Gardner Const. Co., Glenwood Springs, Colo.	214,572
7 E. J. Rippy & Sons, New Castle, Colo.	251,964
EE Colorado Department of Highways, Denver, Colo.	196,276

Bids: 3-6-57 Items	Unit	Quantity	Unit Prices 1 C	2
Clear & grub	ls	job	$1,000	$1,500
Remove bridge, sta 54+	ls	job	1,000	1,500
7 structures	ls	job	350.00	150.00
Water line, connect, 49+	ls	job	200.00	350.00
Fence, remove	lf	2,100	0.05	0.05
remove & rebuild	lf	300	0.30	0.30
Excavation, unclassified	cy	79,000	0.68	0.95
ditch	cy	1,000	1.00	1.50
Stripping	cy	2,000	0.20	0.25
Excavation, unclassif struct	cy	300	1.00	5.00
rock	cy	55	10.00	25.00
common	cy	174	10.00	25.00
Backfill, structure	cy	490	3.00	2.00
Tamp, mechanical	hr	100	6.00	7.00
Roll, flat wheel tandem	hr	70	10.00	10.00
3-wheel	hr	10	8.00	10.00
rubber tire, 1 unit	hr	20	8.00	10.00
2 unit	hr	10	10.00	12.00
Flat wheel tandem, f	ea	1	200.00	150.00
3-wheel, f	ea	1	100.00	150.00
Rubber tire, 1 unit, f	ea	1	100.00	150.00
2 unit, f	ea	1	150.00	200.00
Wetting	Mgal	2,360	1.00	1.50
Compaction	cy	9,200	0.05	0.06
Overhaul, station yard		299,000	0.01	0.02
yard mile	ea	4,600	0.20	0.20
ton mile	ea	26,400	0.15	0.10
Gravel surf, gr c	t	5,200	1.20	1.50
Asphalt, 150-200 penetr	t	220	50.00	50.00
road mat', MC Pr	gal	10,600	0.28	0.25
Surf, plant mix asph	t	3,190	5.70	5.00
Concrete, cl A	cy	463	85.00	89.00
Steel, reinforcing	lb	61,700	0.14	0.15
structural	lb	13,000	0.30	0.30
Culvert, CMP, 18"	lf	172	5.00	5.00
24"	lf	834	5.50	6.50
8"	lf	74	3.00	3.00
Pvmt, grout rubble	cy	40	25.00	12.00
Riprap	cy	145	6.00	6.00
Wire fence, comb, met post	lf	8,900	0.45	0.45
Gates, driveway	ea	4	60.00	60.00
comb wire	ea	1	50.00	30.00
Marker, ROW	ea	12	15.00	15.00
Drain pipe, 4x9"	ea	8	7.00	10.00
Guard post, timb, place	ea	84	6.00	3.00
Metal apron 18" CMP	ea	2	35.00	30.00

Time to complete: 150 calendar days
Liquidated damages: $50.00 per day

HOW TO HANDLE
WET JOBS

FAIRCHILD ENGINE
& AIRCRAFT BLDG.
Islip, Long Island, N. Y.
Sub. Contr.: Washington Conc. Corp.
Gen. Contr.: John W. Harris

WATER LOWERED 11 FT AT
RATE OF ONE FT PER HOUR

ANYONE WHO HAS tackled a wet job in extremely coarse sand and gravel knows what torrents of water drain through such pervious soil. Yet 11 hours was all it took for the Griffin Wellpoint system shown in photo to give a bone-dry subgrade. Excavation of the 20,000 sq ft area then proceeded rapidly by tractor-scraper.

Upon the recommendation of Alman, Fordice & Handy, architects, the wellpoint system was maintained in operation until danger of flotation was eliminated by construction.

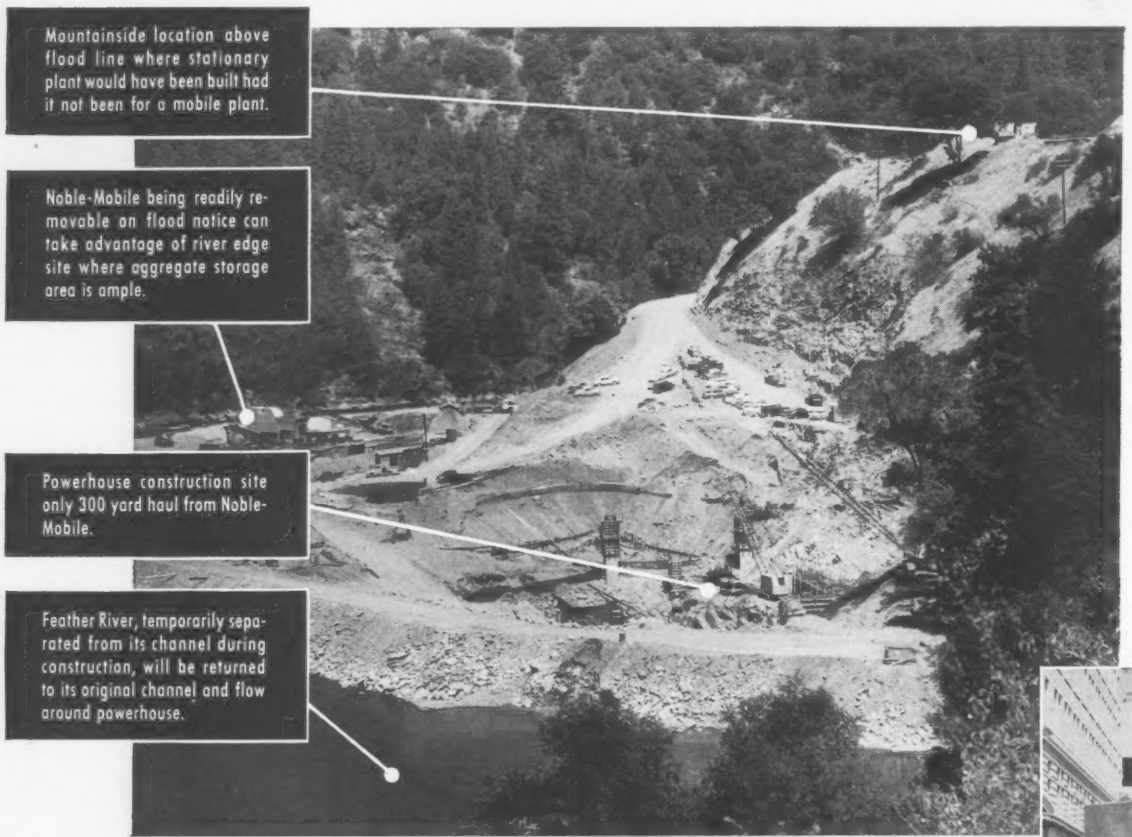
• Footnote: drainage of surrounding area caused 4 ft drop in static level of a well 400 ft away. Got a "big dry"? Specify Griffin.

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

How NOBLE-MOBILE solved floodpr

Flash floods that could wash away a fixed batching plant installation were a threat at the site of the powerhouse construction by the Bechtel Corporation for Pacific Gas & Electric Company on the Feather River, California. A gravel bar at the river edge was the logical site for a concrete batching plant because it was the only place with sufficient area for aggregate storage. Yet, with flood danger, the only practical alternative site was a point 110 ft. up the canyon wall off the Western Pacific Railroad right-of-way. A stationary plant there would have required extensive concrete foundations and a major earthmoving job to level an area of sufficient size to store aggregates. The site also would have entailed transit truck hauls under all weather conditions down a steep grade.

Noble-Mobile made the mountainside installation unnecessary. This batching plant on wheels was put into operation at the river edge as it could be hauled out to high ground on only a day's notice of flood. The mobility permitted scheduling work for 12 months a year so that the job could be completed by 1958. Noble-Mobile saved 70% in installation costs as against a stationary, mountainside plant. On this project, Noble-Mobile normally has to operate only 50% of the working day in order to provide the 25,000 yards of concrete that ultimately will be used. The batch is hauled by transit trucks to the construction site only 300 yards distant.

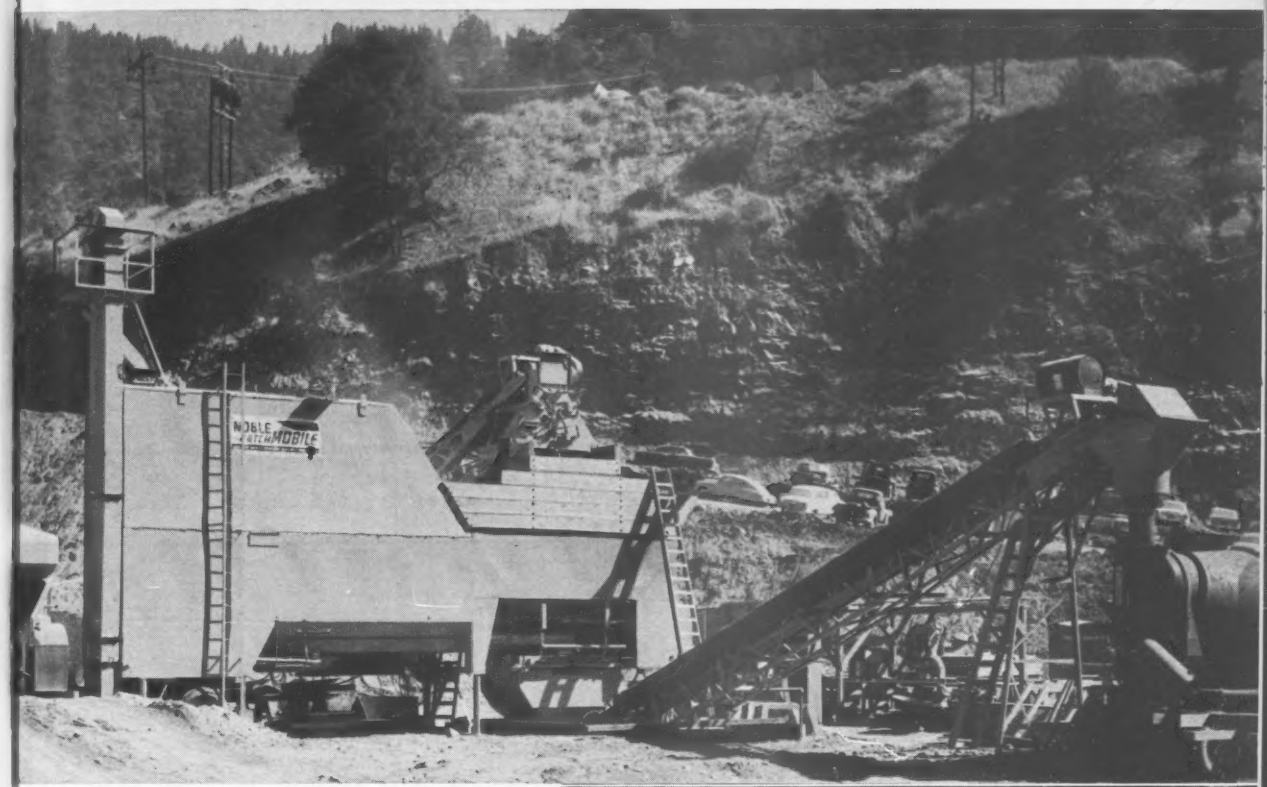

Mountainside location above flood line where stationary plant would have been built had it not been for a mobile plant.
Noble-Mobile being readily removable on flood notice can take advantage of river edge site where aggregate storage area is ample.
Powerhouse construction site only 300 yard haul from Noble-Mobile.
Feather River, temporarily separated from its channel during construction, will be returned to its original channel and flow around powerhouse.

View of construction of semi-outdoor powerhouse designed to withstand the damaging effects of flood. Outside dimensions will be 175 ft. by 116 ft. by 87 ft. high. Construction area has been separated from the river course by a low temporary levee around the area for the period of the construction. The foundation of the plant is at the bottom of an excavation to a depth of 51 feet below the river surface. On completion of the project, the river will be returned to its original channel. 36 ft. of the powerhouse will extend above the normal river level.

NOBLE-MOBILE Batchmobile®
Covered by patents pending

WRITE FOR CIRCULAR
THE NOBLE COMPANY • 1860-7TH ST., OAKLAND 20, CALIF. • TEMPLEBAR 2-5785
Branches: 20950 Center Ridge Road, Cleveland 16, Ohio. EDison 1-3426
518 First Ave. North, Seattle, Wash. MUtual 4878
218 Richmond St., El Segundo (Los Angeles), Calif. EAstgate 2-4518
International Sales Agent: Frazar International Corp., San Francisco

odproblem and saved 70% in installation cost



NOBLE-MOBILE BATCHING PLANT

supplies concrete to transit trucks. May also be used for dry batch or pre-mix. Has bulk cement storage silo with truck hopper unloading screw and elevator. Weighs aggregates and cement separately and simultaneously. Automatic or semi-automatic control. No field wiring or concrete foundations required on base plant.

Noble-Mobile is driven to the job site and goes into production promptly. Purchase is easier to finance than stationary plant.

1,000 yards of 2½", 1½", ¾" aggregates and sand, hauled by truck from Oroville 25.1 miles away, are stored in compartmented piles at the site. They are fed by a scooploader to a conveyor, leading to the plant. The materials are automatically batched and discharged by a conveyor to the transit trucks for the approximate 2-minute haul to the pouring site.

DISTRIBUTORS: BIRMINGHAM, ALA., Equipment Service Co., Inc. • LOS ANGELES, CALIF., Smith-Booth-Usher Co. • DENVER, COLO., Western Machinery Co. • MIAMI, FLA., Neff Machinery, Inc. • CHICAGO, ILL., Arrow Contractors Equipment Co. • INDIANAPOLIS, IND., Manufacturing Machinery Co., Inc. • CEDAR RAPIDS, IOWA, James W. Bell Co., Inc. LOUISVILLE, KY., Emmett C. Watson Co. • BALTIMORE, MD., General Supply & Equipment Co. • BOSTON, MASS., Hedge & Mattheis Co. • DETROIT, MICH., R. G. Moeller Co. ST. PAUL, MINN., Borchert-Ingersoll, Inc. • KANSAS CITY, MO., Funkhouser Machinery Co. • ST. LOUIS, MO., George F. Smith Co. • DUNELLEN, N. J., Miller Equipment Co. CHARLOTTE, N. C., Spartan Equipment Co. • CLEVELAND, OHIO, Wepco Equipment Co. • OKLAHOMA CITY, OKLA., Herd Equipment Co. • PORTLAND, ORE., Clyde Equipment Co. • PHILADELPHIA, PA., Furnival Machinery Co. • PITTSBURGH, PA., Equipment & Supplies, Inc. • NASHVILLE, TENN., Peterson Machinery Co. • AMARILLO, TEX., Plains Machinery Co. • DALLAS, TEX., North Texas Equipment & Supply Co. • EL PASO, TEX., Border Machinery Co. • HOUSTON, TEX., Boehck Engineering Co., Inc. • SAN ANTONIO, TEX., Contractors Machinery Co. • WACO, TEX., Richards Equipment Co. • SALT LAKE CITY, UTAH, Arnold Machinery Co., Inc. • SEATTLE, WASH., Star Machinery Co. • SPOKANE, WASH., Intermountain Equipment Co. • CASPER, WYO., Studer Tractor & Equipment Co., Inc. • CALGARY, ALB., Precision Machinery & Foundry Co., Ltd. • VANCOUVER, B. C., Westcoast Equipment Co., Ltd. • WINNIPEG, MAN., Huggard Equipment Co., Ltd. • TORONTO, ONT., Ontario Equipment & Supply, Ltd. • MONTREAL, QUE., Laurentide Equipment Co., Ltd.

Materials and Labor Prices — Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES

- Cement, Aggregate, Ready-mixed Concrete, Asphalt: Last, May 9; Next June 6
- Iron and Steel Products, Pipe: Last, May 16; Next June 13
- Wood Products, Glass, Explosives, Chemicals: Last, May 23; Next, June 20
- Clay Products, Lime, Plaster, Paint, Roofing: Last, May 30; Next, June 27

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION — SCORED Per M. lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE — LOAD BEARING — SCORED Per M. lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity Common backing	Straight hard	LIME Per ton, in paper, Carload lot, Hydrated finishing	Common hydrated	Pulverized or lump
Atlanta[a]	$149.90p	$149.90p	$299.80p	$334.55p	.....	.....	$30.50p	$32.70p	$23.50	$24.50	$.....
Baltimore	203.00	217.00	406.00	485.50	596.00	681.00	36.00k	41.00k	33.00	22.00	.....
Birmingham	135.00p	152.00p	.....	303.00p	376.00p	465.00p	27.00ff	38.00gg	35.02	22.30	26.33
Boston	217.00†	231.00†	434.00†	520.50†	.....	.....	41.50p	46.50p	39.20†	31.20†	.....
Chicago	135.00	145.00	280.00	.....	.....	.....	30.00	32.00	35.00	35.20o	.....
Cincinnati	205.00j	225.00j	296.00jdd	213.00j	288.00j	314.00j	45.75j	47.00j	30.04j	26.04j	30.04j
Cleveland	209.00	223.00	.....	.....	.....	.....	43.00	47.00	31.00	26.00	.....
Dallas	152.00	152.00	277.50	337.50	414.75	513.50	25.75	45.00	41.60	25.08	27.65
Denver	.....	.....	.....	.....	.....	.....	36.00	47.50	46.00p	42.00p	46.00p
Detroit	253.00	275.00	506.00	.....	616.00	704.00	44.00p	44.50p	38.00	30.00	.....
Kansas City	158.00	158.00	312.00	312.00	410.00	500.00	33.00	33.00	36.26	34.26	29.76
Los Angeles	r	r	r	r	r	r	30.50§	.....	34.00	34.00	35.00
Minneapolis	185.00p	210.00p	429.00p	210.00pw	.....	.....	43.00+p	52.50ii	46.00bbe	36.00bbe	48.00bbde
Montreal	170.00aq	178.00au	325.00au	270.00	400.00	.....	42.00	49.00	39.00	22.00	13.25u
New Orleans	186.00	186.00	380.00	380.00	.....	.....	40.00	55.00	44.00	32.00	32.00
New York	158.10h	168.60h	231.70ch	233.90kn	.....	.....	44.00	.....	37.00	35.00	..
Philadelphia	156.30	166.80	312.70	375.20	.....	.....	50/34	34/40	27.60	26.60	3.17m
Pittsburgh	154.00	162.00	292.00	340.00	490.00	485.00	.....	.....	.....	.....	.....
St. Louis	179.00p	203.00p	358.00p	500.00p	450.00	621.50	43.00al	41.50s	0.95aaa	.80aaa	1.35ss
San Francisco	156.55*	177.10*	235.30dd*	.....	.....	.....	42.50*	42.50*	27.75	27.75	30.50i
Seattle	225.00p	250.00p	450.00p	250.00pw	.....	.....	43.00s	57.00s	52.00ssb	40.00bb	4.50mbb
Toronto	138.70	148.70	273.75	222.00f	375.00	.....	25.00	63.00	36.00	33.50	31.00

*†F.o.b.yard Roxbury. *a Smooth. *b Per 50 lb. bags. *c 6 x 12 x 12 In.-3 cell. tax extra. *r Not used because of earthquake danger. *s 2% discount for cash. *t 5½ x 8 x 11¼. *u Tax exempt. *v Sand lime. *w 5 x 8 x 12. *y Stacked. *d Pulverized hot. *e 5%, 10th following month. *f 8 x 8 x 12. *g 5½ x 8 x 12. *z Pebble lime price per 80 lb. sack. *aa Price per sack. Lime not sold per ton. *bb L.C.L. *h F.o.b. trucks, job site N.Y.C. *i 60# sacks. *j Truck load or over. *k $1.00 discount. *l Red face. *m Per bbl., 180 lb. *n 7¾ x 7¾ x 12. Sneed tile. *dd 6 x 12 x 12. *ee Pebble lime. *ff 80% common. *gg Rough. $40.00 Smooth *o mason's double hydrated pressure. *p Truck lots. *q Provincial and Municipal *ii Chi common. § F.o.b. yard. **F.o.b. plant Stockton.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry a	WHITE LEAD Per 100 lb. in 100 lb. cases In oil w	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES; Carload lots f.o.b. factory Rolls, slate surfaced, 85-90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 300 lb. bbl. per ton
Atlanta	$19.25	$28.275	$3.59	$3.86	$3.81	$3.39	$2.20	$2.62	$0.67	$57.75
Baltimore	19.00	27.90	2.75	4.25	3.35	2.78	4.25	4.25	.48	50.18
Birmingham	19.25	28.275	3.00	3.40	....	3.37	2.49ii	2.49ii	.87ff	48.00ee
Boston	19.00	27.90	....	....	....	3.63g q	2.83og	2.83og	.50g	56.00g
Chicago	19.00	27.90	....	....	....	3.69‡u	2.98‡o	2.98‡o	45.00‡bbo	55.70‡
Cincinnati	19.00	27.90	....	....	....	2.92	2.50	2.53	.618y	53.96
Cleveland	19.00	27.90	2.3445pgg	2.5133gg	2.8129gg	3.30q	2.54o	2.54o	.454y	47.00gg
Dallas	19.25	28.65	....	3.13B	....	3.00u	5.00o	3.00o	.464	64.00hh
Denver	19.50	28.40	3.29	5.15	3.04	3.11	2.30o	2.45o	.49ff	47.00
Detroit	19.00	27.90	3.35	3.35	2.80	3.30	2.54f	2.40ff	.58‡ff	47.30
Kansas City	19.00	28.65	3.82	3.28	2.90	3.71ii	2.85o	2.85o	.756y	95.70
Los Angeles	19.00	28.15	3.30n	4.50n	4.20n	3.20n	2.15en	l	.70ny	l
Minneapolis	19.00	30.85/28.03	....	....	....	2.90dd	2.41hidd	2.41hidd	.442dd	48.00r
Montreal	.....	21.95	5.03Dfft	5.04Eff	4.65Fff	5.40	4.65f	4.65f	1.60	....
New Orleans	.....	.....	....	....	....	2.74	2.18	2.43	0.689	.....
New York	19.00	27.90	....	....	....	3.15	2.43o	2.43o	.444s	48.00*
Philadelphia	19.00	27.90	3.60	3.40/3.65	3.50/4.60	2.75/3.00	2.94	2.94	.45	48.00
Pittsburgh	19.00	27.90	3.10	3.36	3.68	3.72	2.85o	2.85o	.42	58.75
St. Louis	19.00	27.90	....	....	....	3.70iis	3.95h	3.95h	.46y	54.50
San Francisco	19.00	28.15	3.05	4.25	3.50	2.69	2.09aa	3.10	.47jj	54.00
Seattle	19.00	28.40	3.47mcc	4.19mcc	....	3.72mgcc	3.22kmcc	....	.50mcc	47.20ee
Toronto	.....	.....	....	....	....	4.45	4.10e	4.65o	1.70j	88.00A

*‡ Delivered. * Note: Red lead in oil 50¢ higher than white lead in oil. *a Red lead prices change frequently due to pig lead price changes. *b U. S. War Dept. Spec 3-49A. *c ASTM Spec. D266-31. *d 80% minimum ferric oxide. *e 15 lb. *f Per 432 sq. ft. *g F.o.b.yard, Roxbury. *h Per roll, 65 lb. *i Net carload lot prices: Minneapolis and vicinity. *j 45 gal containers. *k Per cwt. *l Not used. *m 1% discount for cash. *n F.o.b. city. *o Per 60-lb. roll. *p 6-drum, 50 gal. ea. *q Per 90-lb roll. *r F.o.b. factory, Chicago. *s Truckload. *t Federal tax included, add 5% mun. & prov. tax. *u Per 90-lb. square. *v Per ton. *w Price to contractors $1.25 less. *x Minera surfaced. *y 55-gallon container. *z Drums. *aa 15 lb., 324 sq ft roll. *bb Roofers coating and cement; Price per ton. *cc LCL, truck delivery. *dd 2% cash discount. *ee Asphalt pitch in 100 lb. package. *ff 5-gal. drums. *gg F.o.b. factory. *hh Incl. freight. *ii Per roll. *jj Asbestos roof coating. *A 400 lb barrels. *B ASTM Spec D-962-49. *D Std. Black. *E Ready-mixed. *F Over 80% ferric oxide. ** Aver. wt. approx. 425 to 550 lbs. drums.

PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER‡ Neat per ton	Gauging per ton	VERMICULITE‡ Home Insulation pellets	Plaster aggregate	Concrete Aggregate Untreated	PERLITE‡ Plaster Aggregate	Concrete Aggregate Untreated	ALUMINUM SHEET†† Flat .102" th 36"x96" & 48"x144" per lb‡	Corr roof .032" th 35"x12' per sku	STAINLESS STEEL† SHEET-TYPE 302g 20 ga 48"x96-120" per cwthh	28 ga 36"x120" per cwtmm	COPPER WATER* TUBING-TYPE L 2000 ft lots per ft ⅜"b	½"c
			per bag of 4 cu ft										
Atlanta	$31.00	$36.00	$1.55e	$1.65e	$1.80el	$1.65	$1.65	$0.424n	$8.96n	$61.44n	$67.50n	$16.74f	$23.41f
Baltimore	22.85	33.25	0.95	1.15	1.15	1.15	1.65	0.431	0.489r	56.25	64.25	0.1951	0.2745
Birmingham	33.00	39.00	1.55	1.55	1.80l	1.55	1.55	0.471	10.02	62.26	70.76	0.2025	0.2464
Boston	22.00	30.00	1.40	1.40	1.45	1.45	1.50	0.444	28.50op	62.873dd	69.01ddff	0.1674	0.2341
Chicago	26.80	26.80	1.55	1.60	1.60l	1.50	1.50	0.474x	9.805a	62.65aee	71.15aee	0.1674	0.2341
Cincinnati	28.00*	28.00*	1.75	1.75	1.75	1.85	1.90	0.434	9.56	65.03	71.28ff	0.1668	0.2034
Cleveland	28.00	43.00	1.13ii	1.16ii	1.24l	1.45	1.45	0.44aa	8.66	65.08	73.58	16.74f	23.41f
Dallas	30.00	32.00	1.05	1.21	1.37l	1.21	1.32	0.474	0.5075r	64.55	76.30	0.200	0.2810
Denver	25.00	25.00	1.50	1.40	1.50	1.40	1.45	0.444	9.80	65.30gg	73.80gg	0.2006	0.2810
Detroit	25.00	25.00	1.28	1.32	1.41	1.45	1.45	0.455a	9.235a	65.00a	73.50a	16.74f	26.56f
Kansas City	30.00	35.00	1.29	1.45	1.40l	1.40	1.60	0.451	10.95	67.14	75.81	18.99f	26.56f
Los Angeles	26.20	27.20	1.25ii	1.15k	1.25	....	....	0.484	9.96d	64.45	72.95	0.1899	0.2656
Minneapolis	32.00	32.00	1.50	1.60	1.80	1.40	1.40	0.481	....	65.45	78.96ff	0.1674	0.2341
Montreal	27.60	35.60	1.20	1.40	1.50	1.15e	1.15e	0.437	9.92	65.50	.....	0.228	0.287
New Orleans	32.00	45.00	1.25	1.25	1.35	1.25	1.25	0.464	8.303	62.04	70.54	0.1899	0.2656
New York	24.00	30.00	1.30	1.30	1.50	1.30	1.30	0.474ao	9.46ad	65.80	74.30	16.74f	23.41f
Philadelphia	23/25	32.00	1.35	1.35	1.40l	....	....	0.444av	9.46a	53.23a	60.98a	18.57f	26.09f
Pittsburgh	27.50	31.00	1.30	1.30	1.32	1.35	1.35	0.42	9.19	56.81	62.63	0.2045	0.2572
St. Louis	29.00	40.00	1.35	1.60jj	1.55	1.60	1.65	0.434	9.80	68.11	74.36y	16.74fm	23.41fm
San Francisco	27.85	32.00	1.20	1.20	1.40	1.20	1.40	0.49	9.00	64.95	73.45	0.1674	0.2341
Seattle	40.00	43.00	1.45	1.25k	1.85l	1.50k	....	0.489	9.964	63.00	83.00	0.1674	0.2341
Toronto	28.50	45.50	1.20	1.30	1.45l	....	....	0.4095	24.00ae	73.75	86.50	0.2768pp	0.3347pp

‡ trucklots, delivered † fob warehouse * fob city *a delivered *b 1½" O.D. *c ¾" O.D. *d 0.100"th *e 34" x 60" sheet *f per 100 ft *g 5 tons & up; cold roll, anneal & pickled: 2B finish *h 15M lb lots *i 1100 & 3003 alloy, mill finish *k per bag of 3 cu ft *l treated with air entraining agent *m 2-10M ft *n fob mill, fr allow *o 5M lb & up *p per 100 sq ft *r per lb *s 30# bag *t 36" x 96;-10.81 lb/sh; 48" x 144"; 21.7 lb/sh *u 19.31 lb/sh *v fob plant *w 48" x 144" *x 0.125"th *y 27 gauge *aa 18M lb & up *dd add $0.75 cwt for boxing *ee 4 tons & up *ff 26 ga *gg add $2/cwt boxing; $0.75/cwt on skids *hh Theoretical wt for 48" x 96"; 60.4-lb, per sh. *ii 300-bag lots *jj per 100-lb bag *mm Theoretical wt: 19.7-lb per sh. *pp Incl 10% sales tax

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES

- Cement, Aggregate, Ready-mixed Concrete, Asphalt: Last, May 9; Next, June 6
- Iron and steel Products, Pipe: Last, May 16; Next, June 13
- Wood Products, Glass, Explosives, Chemicals: Last May 23; Next, June 20
- Clay Products, Lime, Plaster, Paint, Roofing: Last, May 30; Next, June 27

BUILDING BOARD & LATH AND INSULATION—DELIVERED TRUCKLOAD LOTS

	GYPSUM PLASTER BOARD tapered edge per Msq ft ½"	GYPSUM PLASTER BOARD tapered edge per Msq ft ⅝"	GYPSUM BOARD LATH plain or perf per Msq ft ½" x 16" x 48"	GYPSUM SHEATHING tongue & groove per Msq ft ½" x 2' x 8'	FIBER BOARD SHEATHING asph impreg & coat per Msq ft ½" sq ed	FIBER BOARD SHEATHING asph impreg & coat per Msq ft ½" T&G	FIBER BOARD INSULATION sq edge, paint per Msq ft ½"	MINERAL WOOL INSULATION† loose, per 40-lb bag a	MINERAL WOOL INSULATION† 3" batts per M sf	GLASS FIBER INSULATION† loose, per 40-lb bag a	GLASS FIBER INSULATION† 3" batts per M sf	ALUMINUM FOIL 60¢ Kraft 1 side foil per roll of 250 s. f.	ALUMINUM FOIL Expansible Blanket 2 layers foil per Msq. ft
Atlanta	$70.00	$60.00	$43.50	$70.00	$70.00	$127.00	$70.00	$1.00	$60.00	$2.00[b]	$75.00	.....	.....
Baltimore	51.25[f]	44.75[f]	32.55[f]	55.00[f]	65.00[f]	108.50[f]	69.00[f]	1.30	66.50	1.60	45.00	$4.00[g]	$33.50
Birmingham	73.00	60.00	47.77	75.00	82.00	136.50	81.00	1.40	70.00	1.90	75.00	3.13[g]	.....
Boston	60.00[m]	50.00[m]	36.00[m]	60.00[m]	65.00[m]	120.00[m]	79.00[hh]	1.45	75.00	.....	60.00	6.00	55.50
Chicago	67.00	52.00	43.00	62.00	87.00	125.00	87.00	1.85	80.00	.....	63/65[bb]	5.25[g]	.....
Cincinnati	47.40[w]	42.35[w]	31.55[w]	50.55[w]	70.00[w]	125.00[w]	72.50[w]	1.25	60.00	1.25	73.50	3.12[j]	50.00
Cleveland	60.50	55.00	40.00	65.00	74.00	130.00	80.00	1.35/1.50	75.00	1.60[aa]	60.75[aa]	17.50[o]	50/55
Dallas	58.00	55.00	42.50	65.00	73.50	122.50	70.00	1.90	65.00	1.35	66.10	4.30[g]	.....
Denver	62.00	54.50	41.00	62.00	75.90	126.00	74.90	.....	71.00[j]	1.28[z]	65.00	11.00[r]	21.00
Detroit	59.00	49.50	36.00	61.00	59.50	90.00	59.00	.....	.....	1.95[b]	53.00	.....	.....
Kansas City	55.00	55.00	40.00	65.00	72.00	115.00	75.00	1.40	75.00	1.40	75.00	4.10[d]	45.00/47.00
Los Angeles	64.00	59.00	0.33[bb]z	66.50	71.87	121.25	80.00	.....	83.00	1.35[z]	64.00	4.57[g]	.....[y]
Minneapolis	75.00	65.00	0.40[z]	75.00	70.00	140.00	78.00	1.80	80.00	1.80	80.00	5.50	.....
Montreal	56.00	47.40	36/39	53.00	63.25	.....	63.00	1.30	56.00	1.30	56.00	16.20[g]	56.00
New Orleans	57.00	48.00	45.00	60.00	75.00	125.00	72.50	1.75	68.00[aa]	.....	.....	.....	.....
New York	53.00	45.50	35.00	54.00	74.50	118.00	73.50	1.55	65.00	1.90[b]	67.00	5.20[g]	48.80[z]
Philadelphia	50.00	48.00	34.00	48.50	67.50	105.00	55/60	.....	63/70	.....	70/75	5.60/6.34	34.50/44.50
Pittsburgh	65.00	55.00	40.00	68.00	65.00	105.00	60.00	1.90	72.00	1.90	72.00	4.10	.....
St. Louis	65.00	55.00	39.00	70.00	75.00	120.00	80.00	1.35	85.00	1.65	70.50	5.35[i]	.....
San Francisco	54.00	46.00	0.35[z]	57.00	67.50	108.00	66.50	1.60	66.50	1.60	66.50	4.95	55.00
Seattle	66.00	57.50	46.60	65.00	74.50	125.00	73.50	1.60[y]	74.00	1.60[aa]	80.00[aa]	4.25	46.50
Toronto	61.00	50.00	38.00	64.50	75.00	.....	.....	1.40	60.00	.....	60.00	16.00[o]	45.45

[a] for hand packing [b] per 30# bag [c] 2-side foil [d] 40# kraft paper, 5 Msf, 100/500 rolls [e] 20# sq ft bag, 4" thick [f] full trailer loads [g] 80# kraft paper backing [h] LCL [i] 40 lb roll [j] 80 lb roll [k] flame proof $75.00 [m] 10 ton quantities [n] distributor's siding [o] per Msf roll [p] per sf [r] per cwt [s] per 35# bag [t] insufoil [w] fob city [x] per sq yd [y] 26# bag [z] 32# bag [aa] fob warehouse [bb] 2" [cc] in 250 sf rolls, of 16", 20", or 24" width.

HOURLY WAGE RATES—Base rate + fringe benefits

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasters	Electrical Workers	Steamfitters	Common Labor Building	Common Labor Heavy Const
Atlanta	$3.35	$2.80	$3.05	$2.80	$3.00	$3.20	$3.20+25[c]	$1.45	$1.45
Baltimore	3.45+10[d]	2.95+7½[e]	3.65+7½[e]	2.70/2.95+10[c,Qd]	3.25+7½[e]	3.425	3.30+7½[e]	1.80+7½[e]	1.80+7½[e]
Birmingham	3.50	2.70	3.00+7½[e]	2.52	2.92	3.175	3.25+10[c]	1.50	1.60
Boston	3.65+15[cc]	3.25+10[c,d]	3.55+7½[e]	3.65+10[c,d]	3.50+20[c]	3.30+13[c,R]	3.20+10[c,d]	2.30+7[c,V]	2.30+7[c,V]
Chicago	3.62½+7½[e]	3.35+10[c]	3.55+7½[e]	3.25+5[cm]	3.54+23[c,g]	3.65+22[c,f]	3.37+22[c,aa]	2.57½+7½[e,k]	2.57½+7½[e,k]
Cincinnati	3.60	3.30	3.35+7½[e,k]	3.075/3.3251	3.375	3.50+3[c,N]	3.50+9½[c,Z]	2.35	2.25
Cleveland	3.71½+10[c]	3.74	3.64+10[c]	3.74	3.74	3.765	3.64+10[c,d]	3.00	2.915
Dallas	3.70	2.95	3.12½+7½[e,k]	3.075	3.50+7½[K]	3.12½+7½[e,K]	3.10+7½[e,K]	1.55	1.55
Denver	3.75	3.075	3.10+7½[e]	2.95	3.37+12½[d,hh]	3.00	3.35+15[c,D]	2.10	2.10
Detroit	3.53+38[d,H]	3.20+29[c,u]	3.47½+22½[c,P]	3.20+20[c,yzz]	3.51+24[c,t,w]	3.65+25½[c,H]	3.45+14[c,B]	2.58+15[c,zz]	2.58+15[c,zz]
Kansas City	3.75	2.95	3.10	3.22	3.375	3.325[O]	3.40+7½[e,K]	2.255	2.305
Los Angeles	3.80+8[c,bb]	3.10+10[c,d]	3.40+10[c]	2.95+10[c,d]	3.75+12[c,S]	3.60	3.55+10[c,d]	2.30+7½[e,K]	2.30+7½[e,k]
Minneapolis	4.575	3.15	3.32	3.10	3.25+23[c,G,zz]	3.25[n]	3.215+20[c,d,z]	2.40	2.40
New Orleans	3.325+5[c,m]	2.80	3.20+7½[e]	2.925+5[c,m]	3.00+5[c,m]	3.025+7½[e,K]	3.15+15[c]	1.60	1.60
New York	4.25+37[c,bv]	3.75+30[c,bV]	4.15+24.9[c,P]	4.00+32[c,V]	4.00+50[c,A]	3.65+40[c,P]	3.95+35½[c,bU]	2.65+21[c,V]	2.65+21[c,V]
Philadelphia	3.75+17[c]	3.53	3.80-1.6[c,M]	3.15½/3.90½+10[c]	3.65+15[c,C]	3.77+15[c,w]	4.00+10[c,z]	2.25	2.25
Pittsburgh	3.75+17½[c,w]	3.40+7½[e]	3.55+10[c,w]	3.35+7½[e]	3.45+17½[c,K]	4.00+7½[c,w]	3.425+7½[e,K]	2.25+12½[c,f]	2.25+10[c,d]
St. Louis	3.75+28[c]	3.35+10[d,v]	3.37+7½[e]	3.45	3.55+7½[K]	3.60+25[c]	3.55+21[c,R]	2.40+10[c]	2.40+10[c]
San Francisco	3.75+36½[c,dd]	3.25½+20[c,w]	3.40+10[c]	2.98+10[c]	3.61+20[c,w]	3.37½+23[c,U]	3.45+45[c,K]	2.505+10[c]	2.505+10[c]
Seattle	3.55+10[c]	2.94+10[c,d]	3.25+10[c,d]	3.13+20[c,dc]	3.40+10[c,d]	3.25+19½[c,X]	3.40+23[c,T]	2.51+10[c,d]	2.51+10[c,d]
Montreal	2.20+16[c,†]	2.00+16[c,†]	2.15+16[c,†]	1.90+15[c,†]	2.22+17[c,†]	2.20+18[c,†]	2.22+18[c,†]	1.40+10[c,†]	1.40+10[c,†]
Toronto	2.71+10[c,w,cc]	2.50+15[c,w]	2.50+15[c,w]	2.60+15[c,w]	2.60+18[c,w]	2.65+11[c,w]	2.49+10[c,w]	1.55+6[c,w]	1.55+6[c,w]

ENR Skilled Average (Bricklayers, Carpenters, Ironworkers): $3.499. ENR Common Average $2.272.

"

"Cost of living bonus now included in basic wage. †8% fringe benefits. **4% vacation fund. [a] 6 hr. day. [b] 7 hr. day. [c] 8% vac. stamp fund plus 10¢ WF for bricklayers: 4% VF for electricians plus 8¢ WF, 1% PF. [d] 10¢ H&WF. [e] 10¢ VF. [f] 6% WF. [g] 1½% WF 5¢ apprentice, 2½¢ indus fund. [h] $2.85 homes & housing plus 7½¢ WF. [i] 17¢ WF. [j] 10½¢ hr. WF. [k] 7½¢ hr. WF. [l] 4% VF. [m] 5¢ hr. WF. [n] Plus 11% fringe benefits on gross wage ea. yr. [o] 10¢ PF. [p] 3% WF, 3% PF [q] 10¢ ins: 6% vac. and holiday pay. [r] 4% WF and 20¢ PF. [s] 5% W&PF, 4% VF, 1% NC, 8PH. [t] 7½¢ H&WF. [u] 1½% PF. [v] 10¢ WF. [w] Negotiating. [x] 5¢ VP. [y] 23¢ WF. [z] 5¢ HP. [A] 15¢ WF, 15¢ PF, 20¢ BF. [B] 7½¢ VP, 5¢ PF, 1½¢ EF. [C] 15¢ WF. [D] 10¢ H&WF, 5¢ organ. [E] 6% WF, plus travel pay per day. [F] Plus $4 per day Annuity contrib. [G] 3¢ Prom. [H] FB [I] 15¢ H&WF, 5¢ for Advtg. [J] 5% WF, 6 PH, 3% PF. [K] 25¢ W&PF, 15¢ VF. [L] 3% WF, 3% PF, 2% VF. 1% EF. [M] 7½¢ PF. [N] 1% WF. [O] 10¢ W, 1% NECA. [P] 10¢ health ins.; 7½¢ PF, 5¢ VF. [Q] 1 drum, 2 drums 3.40/3.55+10¢. [R] 10¢ H&WF, 2¢ admin. and 1¢ apprentice. [S] 12½¢ H&WF. [T] 23¢ H, W&VF. [U] 7½¢ WF, 4% VF, 1% PF. [V] 4% WF, 3% PF. [W] 2% F. [X] 12¢ VF, & 7½¢ H&WF. [Y] 7¢ H&WF. [Z] 9½¢ WF. [aa] 7¢ WF, 15¢ PF. [bb] 8¢ WF. [cc] 25¢ H&WF. [dd] 12½¢ WF, 14¢ PF, 5¢ Jt Bd 5¢ Prom % [ee] 7½¢ FB. [ff] 7½¢ ins. [gg] 10¢ ins. [hh] 7½¢ H&WF, 5¢ indus. prom. [ii] 15¢ H&WF."

	Truck drivers 1½ T	Truck drivers —4 cy	Truck drivers +4 cy	Tractor Operators—Incl. bulldozers— 34-49 hp	70-100 hp	100 & over	Tractor scraper 15-16 cy	Power cranes & shovels ½ cy	Power cranes & shovels ¾ cy	Motor grader oper	Air comp oper	Air tool oper
Atlanta	$1.75	$.....	$.....	$2.525	$2.525	$2.525	$2.525	$3.05	$3.05	$2.525	$2.30	$1.67
Baltimore	1.60+7½[e,u]	1.75+7½[e,u]	1.85+7½[e,u]	2.85/3.30[b]	2.85/3.30[b]	2.85/3.30[b]	2.85/3.30[b]	3.40/3.55+10[c,m]	3.40/3.55+10[c,m]	2.85/3.30[b]	2.85/3.30[b]	2.25
Birmingham	1.60	1.79[ff]	2.05[zz]	2.66	2.66	2.66	2.80	2.80	2.80	2.76	2.385	1.75
Boston	2.195[c]	.....	.....	3.275+10[c,d,m]	3.275+10[c,d,m]	3.275+10[c,d,m]	3.275+10[c,d,m]	3.65+10[c,m]	3.65+10[c,m]	3.275+10[c,m]	3.20+10[c,m]	2.60+7[c,e]
Chicago	2.16+12½[rr]	.....	.....	3.00+5[c,n]	3.15+5[c,n]	3.20+5[c,n]	3.00+5[c,n]	3.60+5[c,n]	3.60+5[c,n]	3.25+5[c,n]	3.10+5[c,n]	.....
Cincinnati	2.20[zz]	2.30[zz]	2.40[zz]	3.075	3.075	3.075	3.075	3.325	3.325	3.325	3.325	3.325
Cleveland	2.625+10[c,m]	2.625+10[c,m]	2.625+10[c,m]	3.49	3.49	3.49	3.49	3.74	3.74	3.49	3.365	3.365
Dallas	1.55	1.55	1.55	1.55/2.625[f]	1.55/2.625[f]	1.55/2.625[f]	1.55/2.625[f]	1.55/2.625[f]	1.55/2.625[f]	1.55/2.625[f]	1.55/2.00[f]	1.70/2.00[f]
Denver	2.20	2.30	2.45	2.20	2.80	2.80	2.80	2.95	2.95	2.80	2.80	2.40
Detroit	2.45	2.45	2.45	2.50+10[c,m]	2.50+10[c,m]	2.50+10[c,m]	2.50+10[c,m]	2.50+10[c,m]	2.50+10[c,m]	2.50+10[c,m]	3.225+10[c,m]	2.81+10[c,m,m]
Kansas City	2.23[n]	2.23[o]	2.305[p]	2.425	2.975[o]	2.975[o]	2.975[r]	3.095[w]	3.095[w]	2.71[w]	2.985[f]	2.365
Los Angeles	2.405+7½[e,u]	2.405+7½[e,u]	2.435+7½[e,u]	3.05+10[c,m]	3.05+10[c,m]	3.05+10[c,m]	3.30+10[c,m]	3.30+10[c,m]	3.30+10[c,m]	3.30+10[c,m]	2.54+10[c,m]	2.51+7½[e,u]
Minneapolis	2.40	2.40[v]	2.55[t]	2.78	3.00[v]	3.07[z]	3.00	3.22[y]	3.48[z]	2.78	2.67	2.38
New Orleans	1.75	2.00	2.00	2.275+7½[e,u]	2.925+7½[e,u]	2.925+7½[e,u]	2.925+7½[e,u]	2.925+7½[e,u]	2.925+7½[e,u]	2.925+7½[e,u]	2.275+7½[e,u]	1.70
New York	2.21[aa]	2.75+14[c,bb]	2.75+14[c,bb]	3.37½+27[c,h]	3.37½+27[c,h]	3.37½+27[c,h]	3.50+28[c,h]	4.25+34[c,h]	4.25+34[c,h]	3.50+28[c,h]	3.50+28[c,h]	3.10+15[c,zz]
Philadelphia	——	1.925/2.15+7½[e,u]	——	——	3.15½/3.90½+10[c,m]	——	3.15½+3.90½	— 3.15½+3.90½+10[c,m]	— 3.15½+3.90½+10[c,m]	3.15½+3.90½ +10[c,m]	2.97½+10[c,m]	2.13½+10[c,m]
Pittsburgh	2.20+7½[e,u]	2.20+7½[e,u]	2.20+7½[e,u]	2.87½+7½[e,u]	3.20+7½[e,u]	3.27½+7½[e,u]	3.025+7½[e,u]	3.35+7½[e,u]	3.35+7½[e,u]	3.25+7½[e,u]	3.35+7½[e,u]	2.20+7½[e,u]
St. Louis	2.50+7½[e,u,nn]	.....	.....	3.45[k,k]	3.45[k,k]	3.45[k,k]	3.45[k,k]	3.45[c,k]	3.45[c,k]	3.45[k,k]	2.90[k,k]	2.90[k,k]
San Francisco	2.32½+10[c]	2.32½+10[c]	2.46½+10[c]	3.095+10[c]	3.095+10[c]	3.095+10[c]	3.095+10[c]	3.425+10[c]	3.425+10[c]	3.255+10[c]	2.705+10[c]	2.425+10[c]
Seattle	2.63+7½[e,u]	2.63+7½[e,u]	2.83+7½[e,u,ee]	3.10+20[c,ll]	3.10+20[c,ll]	3.10+20[c,ll]	3.10+20[c,ll]	3.46+20[c,ll]	3.46+20[c,ll]	3.19+20[c,ll]	2.85+20[c,ll]	2.71+10[c,m]
Montreal	1.40+11[c,ll]	1.40+11[c,ll]	1.40+11[c,ll]	1.60+15[c,ll]	1.83+15[c,ll]	1.83+15[c,ll]	1.83+15[c,ll]	2.09+16[c,ll]	2.09+16[c,ll]	1.83+15[c,ll]	1.70+15[c,ll]	1.70+15[c,ll]
Toronto	1.60+6[c,ll]	1.60+6[c,ll]	1.60+6[c,ll]	2.00+10[c,ll]	2.10+10[c,ll]	2.10+10[c,ll]	2.10+10[c,ll]	2.60+16[c,ll]	2.60+16[c,ll]	.....	2.15+8[c,ll]	2.15+8[c,ll]

[a] 5¢/hr. H&WF [b] lower rates, straight time, other broken [c] 2-axle; 10-wheel $2.25; Euclid $2.45 [d] Intermediate [e] bldg constr: highway $2.45+7¢WF [f] less than 2-T [g] up to 6 cy [h] 4% WF, 4% PF [i] 6-8 cy [j] plus $2 pd by employer for hosp. death benefits to family [k] bldg constr; steel constr $3.475 [l] higher rates are union, other taken from min wage scale approved by County Commissioners Court [m] 10¢ H&WF [n] flatbed [o] under 10 cy [p] over 10 cy [q] over 50 hp [r] blade grader [s] 10¢ WF [t] single [u] 7½¢ H&WF [w] negotiating [x] cat oper [y] up to 3½ cy [z] 3½ cy & over [aa] plus W & PF [bb] 3% WF, 2% PF, 11PH [dd] up to 5 cy [ee] 5 cy & over [ff] over 1½T but not over 3 [gg] up to 5 tons [hh] excavating [ii] 4% VF [kk] 7½¢ WF included in base pay [ll] 8% fringe benefits [mm] 10¢ H&WF, 10¢ insurance [nn] 8 cy or less; 8-16 cy $2.90; 16-25 cy $3.15 [oo] Plus $2.25/wk WF [rr] 12¢ WF [ss] 5% WF [tt] 10¢ H&WF, 10¢ PF

MEXICO CITY PRICES

In Pesos, F.o.b. City		Apr. '57	May '57
Common Wages—Building (8 hr. day) (Peons)	av. per hr.	1.38	1.38
Common Wages—Heavy Const. (8 hr. day) (Peons)	av. per hr.	1.38	1.38
Skilled Labor Wages			
Carpenters (8 hr. day) 1 cl.	av. per hr.	2.48	2.48
Bricklayers (8 hr. day) 1 cl.	av. per hr.	2.48	2.48
Struct. Iron Workers (8 hr. day)	av. per hr.	3.77	3.77
.....Remachadores.	av. per hr.	3.77	3.77

Struct. Steel, Shapet		Apr. '57	May '57
3"-15" x 12 meters	per metric ton	2100.00#	2100.00#
# fob Monterrey			
Reinf. Steel, Corr. Rods			
⅜" x 11 meters	per ton	2000.00	2000.00
½" x 11 meters	per ton	2000.00	2000.00
⅝" x 11 meters	per ton	2000.00	2000.00
¾" x 11 meters	per ton	2000.00	2000.00
⅞" x 11 meters	per ton	2000.00	2000.00
1" x 11 meters	per ton	2000.00	2000.00

Gravel truck load at 3½ cu. meters		Apr. '57	May '57
Blue Gravel	per tr. load	75.00	75.00
Rose Gravel	per tr. load	73.00	73.00
Cement, Std. Port. (Tolteca)	per tan	240.00	240.00
Lumber			
1" Pine	per M ft.	1400.00	1400.00
1½" Pine	per M ft.	1650.00	1650.00

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, S. N. NOLAN, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲† **Me., Bucks Harbor**—MISCELLANEOUS BLDGS.—BA 6/13—U. S. Eng., 150 Causeway St., Boston, Mass., miscellaneous bldgs. and utilities, incl. 3 steel tower foundations, sewage sys. and electric distr. sys. extens., operations bldg., recreation bldg. and Airmen's Dormitory, Air Station. $1,000,000-$1,250,000. Plans deposit $25. Alonzo B. Reed, Inc., 88 Broad St., Boston, Mass., engr.

HEAVY CONSTRUCTION—LB & CA

▲ **VERMONT**—State Hy. Dpt., State Office Bldg., Montpelier,
W. H. Hinman, North Anson, Me., LB $3,344,155. hy. and bridge work, combined bids 04 and 05, Proj. IN-001 (4) and IN-001 (5), Guilford and Vernon. Bids May 17. CD 4/30.

▲ **RHODE ISLAND**—State R. I. & Prov. Plants, Div. Purchases, State House, Providence,
Campannela & Cardi Constr. Co., 780 Jefferson Blvd., Warwick, R. I. LB $3,343,194, est. $2,500,000. 4-lane highway Grace St. and East Ave. to west abutment part Bridge-East and north to Broadway. Bid 975, Contr. 5753 FA. Proj. 1-01 (1), Pawtucket. Bids May 15. CD 5/7.

▲ **CONNECTICUT** — State Hy. Comn., State Office Bldg., Hartford,
Conn.—S. Ippolito & Sons, Inc., and Albert A. Lutz Co., Inc., 122 Selleck St., Stamford, Conn. CA $750,000. Proj. 315-09, Group B, 50-stall maintenance and repair garage, incl. salt storage bldg., jet sander bldg., chloride and joint filler Bldg., etc. Conn. Turnpike, Milford;
Conn.—Pearce Constr. Co. Inc., 1626 Hartford Turnpike, North Haven, Conn., CA $561,400. Proj. 322-03, Group D, 35-stall maintenance and repair garage, incl. salt storage bldg., jet sander bldg. chloride and joint filler bldg., parking areas, etc. Conn. Turnpike, Old Saybrook. Bids Apr. 25, awarded May 14. CD 5/1, under LB.

CONNECTICUT—State Hy. Dpt., 165 Capitol Ave., Hartford,
Associated Constr. Co., 1010 Wethersfield Ave., Hartford, Conn., CA $919,000. Proj. 326-06 dual service stations, incl. site imprvs., site utilities, landscaping, exterior lighting, product piping tanks, pumps and related work, Montville. Bids Apr. 18, awarded May 13. CD 4/23, under LB.

BUILDINGS—LB & CA

† **U. S. Eng.**, 150 Causeway St., Boston, Mass., rejected bids Apr. 5, FAMILY QUARTERS (35) MCA, Fort Devens, ENG-19-016-57-181. AYER, MASS. LB est. $830,000. Will re-advertise. CD 4/11, under LB.
▲ **Concrete Constr. Co.**, 165 Chelsea St., Everett, Mass., LB $1,595,000, SENIOR HIGH School, off Forest Ave., SWAMPSCOTT, MASS., Town, Supt. Schools, Hadley School, 24 Redington St. Bids May 16. CD 5/7.
Aberthaw Constr. Co., 60 State St., Boston, Mass., CA $500,000 LABORATORY No. 2 for Missiles systems program, Waltham Industrial Park, Rte. No. 128, WALTHAM, MASS. Sylvania Electric Products, Inc., Electronics System Div., 100 1st Ave., Waltham, Mass.
▲ **Daniel O'Connel Sons, Inc.**, 480 Hampden St., Holyoke, Mass., LB $1,667,672, HOSPITAL Addn., WESTFIELD, MASS., Noble Hospital, 105 W. Silver St., Westfield, Mass., Bids May 17. CD 4/23.

MIDDLE ATLANTIC

BUILDINGS—BA

N. Y., Ithaca—HOSPITAL—BA 6/5—Tompkins Co. Bd. Supervs., H. M. Biggs Memorial Hospital addn., alterations, $750,000. Plans deposit $25. Sherwood Holt, 119 W. Buffalo St., archt. Bids 4/12 rejected.
▲† **D. C., Wash.**—HOUSING—BA 6/18—National Capital Housing Auth., 1729 New York Ave. N.W., Housing Proj. DC-1-21, 456 dwelling units, Greenleaf Gardens, between Eye and N Sts. and 3 and Canal Sts. S.W., $4,000,000. Plans deposit $50. Berla & Abel, 1636 Connecticut Ave. N.W., archts. CD 3/24/55.

HEAVY CONSTRUCTION—LB & CA

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,
Nello L. Teer & Co., Trust Bldg., Durham, N. C., CA $815,602, wid'n., relocating, surf., grading, drainage, 4.614 mi. State Rte. 31, near Manchester, Contr. CL-342-2-720, Carroll Co., CD 1/29, under LB.

BUILDINGS—LB & CA

▲ **Blitman Constr. Co.**, 101 Park Ave., New York 17, N. Y., CA Est. $3,000,000. 14 story APARTMENT, incl. 202 units, 1270 Fifth Ave. at 108 St., NEW YORK, N. Y. Fifth Avenue Co-operative Apartments, c/o H. Herbert Lilien & Clarence Lilien, archts., 201 W. 72 St., New York 23, N. Y. CD 3/1.
Irish Constr. Co., 1013 S. State St., Syracuse, N. Y., CA $734,855. Mott Rd. Elementary SCHOOL, FAYETTEVILLE, N. Y. Bd. Educ., Manlius-Fayetteville Central School Dist. No. 1, Fayetteville, N. Y. Bids May 9.
▲ **Magnuson Constr. Co.**, 2836 Boulevard, Jersey City, N. J., LB $1,000,000. OFFICE and WAREHOUSE, 443-55 W. 40 St. and 440-52 W. 41 St., NEW YORK, N. Y. Diana Stores Corp., 320 W. 40 St., New York, N. Y. CD 10/15.
Cauldwell-Wingate Co., 101 Park Ave., New York 17, N. Y., CA Est. $500,000. Albert Einstein COLLEGE OF MEDICINE, Morris Park Ave. and Eastchester Rd., Bronx Boro., NEW YORK, N. Y. Yeshiva University, 110 W. 57 St., New York 19, N. Y. CD 2/20.
▲ **Cauldwell-Windgate Co.**, 101 Park Ave., New York 17, N. Y., CA Est. $1,000,000. Gottesman MEDICAL LIBRARY at Albert Einstein College of Medicine, Eastchester Rd. and Morris Park Ave., Bronx Boro, NEW YORK, N. Y. Yeshiva University, 110 W. 57 St., New York 19, N. Y. CD 11/28.
Postal Constr. Co., Inc., 383 Pearl St., Brooklyn 2, N. Y., CA Est. $700,000. PRIVATE MENTAL INSTITUTION, 420 E. 76 St., NEW YORK, N. Y. Richard & Lawrence Zirinsky, 383 Pearl St., Brooklyn, N. Y. CD 11/29.
▲ **Uris Brothers**, 300 Park Ave., New York 22, N. Y. Owner Builds, $15,000,000. 28 story HOTEL, 3 Ave. between 51 and 52 Sts. to incl. N. Y. C. POLICE STATION and FIRE HOUSE, NEW YORK, N. Y. CD 9/27.
▲ **Dan McCarron & Son**, 550 Pine St., Elizabeth, N. J. LB $1,150,550 (3 bidders), Thomas Jefferson HIGH SCHOOL addn., ELIZABETH, N. J., Bd. Educ., Elizabeth, N. J. Leslie M. Dennis & Sons, 134 Elmora Ave., Elizabeth, N. J., archts. CD 5/6.
Carl Vogelsbery, 15 Drakes Lane, Irvington, N. J. LB $857,030, general contract, JUNIOR HIGH SCHOOL, Mt. Pleasant Ave., LIVINGSTON, N. J. Bd. Educ., Twp. of Livingston, Livingston, N. J. Bids May 9. CD 3/29.
R. Newman, 1136 Easton Rd., Roslyn, Pa., Separate Contracts. $750,000. RESIDENTIAL DEVELOPMENT, Ashbourne Rd., etc. CHELTENHAM, PA. S. Sherwin Rochlis, 1325 Walnut St., Phila., Pa., archt.
▲ **J. H. Greiner & Co.**, 826 Walnut St., Lebanon, Pa. CA $1,788,073 HOSPITAL addns., alterations, LEBANON, PA. Good Samaritan Hospital, Fourth and Walnut Sts., Lebanon, Pa. CD 4/12, under LB.
▲ **Levitt & Sons, Inc.**, Levittown, Pa., Separate Contracts. $1,350,000. RESIDENTIAL DEVELOPMENT, Deepdol, Highland Park (new section), LEVITTOWN, PA. CD 4/25.
United Constr. Co., 1204 Lincoln Ave., Pittsburgh, Pa. LB $996,000 (7 bidders) general contract Secondary SCHOOL for Joint School Bd. of Laurel, Lawrence Co., NEW CASTLE, PA. Pub. School Bldg. Auth. 101 S. 25 St., Harrisburg, Pa. Bids May 14.
▲ **McCloskey & Co.**, 1620 W. Thompson St., Phila., Pa., LB $3,465,000 general contract Benjamin Franklin SENIOR HIGH SCHOOL, PHILA., PA. Bd. Educ., 21 and Winter Sts., Phila., Pa. Bids May 2. CD 4/25.
▲ **James McGraw Co.**, 2043 Eastburn Ave., Phila., Pa. LB $1,697,000 general contract HIGH SCHOOL, incl. swimming pool, parking area and greenhouses, ROYERSFORD, PA. Spring-Ford Joint School Bd., Royersford, Pa. Bids Apr. 24. CD 3/29.
Gerard & Pettinato, 1512 N. Main St., Scranton, Pa. LB $933,000. HIGH SCHOOL addns., Alterations, TOWANDA, PA. Towanda Valley Area Joint School Dist., Towanda, Pa. Bids May 2.
James H. Wood, Dover, Del. CA $671,000. high school AUDITORIUM, DOVER, DEL. Dover Special School Dist., Dover, Del. Bids May 1. CD 3/21.
▲† **William T. Lyons Co.**, 28 E. Susquehanna Ave., Towson, Md., LB $1,091,000 (6 bidders), Contr. NBy-2566, rehabilitation of Bldg. No. 3, U. S. Naval Experiment Station, ANNAPOLIS, MD. Officer in Charge of Constr., U. S. Naval Academy, Annapolis, Md. Bids May 2, CD 4/12.
▲ **Capitol Development Co.**, Equitable Trust Bldg., 9 and Market Sts., Wilmington, Del., Separate Contracts. $1,500,000. 114-unit RESIDENTIAL DEVELOPMENT, Brookside Park, NEWARK, DEL.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England — **Middle West**
Middle Atlantic — **West of Mississippi**
South — **Far West**

PROPOSED WORK
Water Supply — **Public Buildings**
Sewers, Waste Disposal — **Mass Housing**
Bridges — **Commercial Buildings**
Streets & Roads — **Industrial Buildings**
Earthwork, Waterways — **Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily
For additional reports see Construction Daily.

SOUTH

HEAVY CONSTRUCTION—BA

▲ **Tenn., East Ridge**—BA 6/18—Town, Town Hall, Sanitary Sewerage Proj. No. 2, 2 m.g.p.d. complete trickling filter type sewage treatment plant and structures and appurtenances; Sanitary Sewerage Proj. 3, approx. 145 mi. 8- to 20-in. sewers, incl. manholes, wyes and other appurtenances. $1,000,000. Plans deposit $50 for Proj. No. 2 and $35 for Proj. 3. Schmidt Eng. Co. & Betts Eng. Co., 817 Broad St., Chattanooga, Tenn., engrs. CD 5/8/56.

HEAVY CONSTRUCTION—LB & CA

▲† **Base Contracting Office**, Homestead Air Force Base, Fla., rejected bids Apr. 30, 1,219 unit Armed Service Housing, vicinity of Air Force Base, IFB-08-621-57-59. HOMESTEAD AIR FORCE BASE, FLA. CD 3/6.
† **Century Constr. Co.**, 8432 Mosley St., Houston, Tex. CA $991,810. underground utilities, water sys. etc., Naval Auxiliary Air Station, NBy 6395, NEW IBERIA, LA. Eighth Naval Dist., Bldg. 16, U. S. Naval Station, New Orleans, La. Bids Apr. 2. CD 5/3, under LB.
▲ **LOUISIANA**—State Hy. Dpt., Baton Rouge,
John F. Beasley Constr. Co., Merchantville Bank, Dallas, Tex., LB $1,192,840 (4 bidders) Carrollton Airline Interchange (Pontchartrain Expressway) Stage II—Rt. 3019 0.49 mi., S.P. 283-08-05, FAP 1-524 (4) Orleans Parish. Bids May 8.
E. N. Murry, Buena Vista, Ga., LB $884,666 (3 bidders) water distr. sys., Terrebonne Parish, HOUMA, LA. Water Dist. No. 3, Houma, La. DeFraites, Box 936, Houma, La., engrs.
Louisiana State Bldg. Auth., State Capitol, Baton Rouge, La., rejected bids May 7, stadium for Southern University, Proj. AE 4 SUL-2, SCOTLANDVILLE, LA. LB $655,240. CD 4/23.
▲† **L. G. Wasson Coal Mining Corp.**, Boonville, Ind., LB $3,497,900. (9 bidders) cofferdam, Barkley dam site, Cumberland River, Livingston Co., KENTUCKY, U. S. Eng., P. O. Box 1070, Nashville, Tenn. Bids May 14. CD 4/11.
▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort, Bids opened May 10,
Ky.—Middle West Roads Co., 1201 Short St., Louisville, Ky., LB $80,976 (6 bidders), bit. surf. Class C-1 and A-2 (limestone aggreg.) 7.558 mi. various roads, SP 42-258; SP 52-828; SP 42-148, Graves Co., LB $141,744 (4 bidders), b. con. surf. Class I and rock asph. 11.091 mi. various roads, SP Group 33 (1957), Meade and Breckinridge Counties;
Ky.—The Allen Co., Inc., Winchester, Ky., LB $135,629, (3 bidders), b. conc. surf. Class I (limestone aggreg. 12.977 mi. various roads, SP Group 16 (1957), Floyd and Johnson Counties;
Ky.—Kentucky Road Oiling Co., Frankford, Ky. and **East Kentucky Paving Corp.**, Grayson, Ky., LB $185,036, (4 bidders), b. con. surf. Class I (limestone aggreg.) 24.32 mi. various roads. SP Group 38, in Carter and Elliott Counties;

(Continued on page 92)

University of Michigan's Switching Station

Uses Youngstown "Buckeye" Conduit

to Protect Electrical Wiring Systems . . Permanently

University of Michigan's new, up-to-the-minute, West Hospital Switching Station has positive, permanent electrical system protection—thanks to Youngstown's Full Weight Rigid Steel "Buckeye" Conduit. Damaging elements such as water, moisture, vapor, dust and dirt will never cause electrical faliure—because "Buckeye" will be on the job around-the-clock for the life of the building.

Electrical systems that fail to function properly are definitely a bad investment—from any standpoint. So to make sure your installations are safe and efficient, always specify Youngstown "Buckeye" Conduit—as so many of our leading owners, architects and contractors have done for years.

Satisfied "Buckeye" users across-the-country report to us, "It's easier to thread and bend—easier to fish wires through—and best of all, we get longer service life because it's so thoroughly corrosion-resistant."

Leading distributors in all industrial and electrical markets are ready to serve you quickly and efficiently from their ample stocks. They're as near as your phone—why not call today?

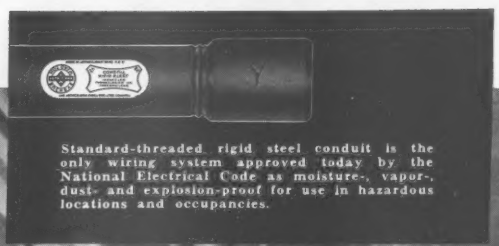
THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

General Offices - Youngstown 1, Ohio

District Sales Offices in Principal Cities

West Hospital Switching Station, University of Michigan, Ann Arbor, Michigan
Engineers: Cummins & Barnard, Inc., Ann Arbor, Michigan
Electrical Contractor: Electric Service Co., Ann Arbor, Michigan



Standard-threaded rigid steel conduit is the only wiring system approved today by the National Electrical Code as moisture-, vapor-, dust- and explosion-proof for use in hazardous locations and occupancies.

(Continued from page 90)

Ky.—**Adams Constr. Corp.,** Paintsville, Ky., LB $268,852, 5 bidders), b. con. surf. Class I (limestone aggreg.) 9.822 mi. The Wayland-Beaver Gap Rd., S 61 (3); SP 60-38, Knott Co.;

Ky.—**R. C. Durr,** Walton, Ky., and **Perrin Constr. Co.,** Cynthiana, Ky., LB $656,417 (13 bidders), traffic bound limestone 12.581 mi. The Golden Pond-Gilbertsville Rd., S 536 (1); SP 72-431, SP 111-714, Lyon and Trigg Counties. CD 4/26.

BUILDINGS—LB & CA

▲ **Bradford Builders, Inc.,** 1101 Lincoln Rd., Miami Beach, Fla., CA $1,029,599. KITCHEN and DINING HALL BLDG. 38, MAXIMUM SECURITY BLDG. No. 39, MAINTENANCE SHOP BLDG. 40, BOILER PLANT ADDN. BLDG. 41, lift station, Southern Florida State Hospital, West Hallandale, FORT LAUDERDALE, FLA. Bd. Comrs. State Institutions, Tallahassee, Fla. Bids Apr. 25, awarded May 8. CD 5/2, under LB.

▲ **Kenneth Smith Constr. Co.,** Box 1031, Daytona Beach, Fla., LB $1,149,222. three elementary SCHOOLS Addns., West Cocoa and Cocoa Beach and Indiatlantic, TITUSVILLE, FLA. Brevard Co. Bd. P. Instruction, Titusville, Fla. Bids May 14. CD 4/24.

▲ **General Refractories Co.,** 1520 Locust St., Phila., Pa., Separate Contracts, $1,000,000. REFRACTORY BLDG., KILNS, dredging and straightening creek, OLIVE HILL, KY.

▲ **Ewing Von Allmen Dairy Co.,** 431 W. Oak St., Louisville, Ky. Owner Builds, $1,000,000. (A) MILK PROCESSING BLDG., (B) ICE CREAM DISTRIBUTION BLDG., (C) GARAGE and paving, LOUISVILLE, KY. CD 4/16.

MIDDLE WEST

BUILDINGS—BA

▲ **Wis., Oak Creek**—FACTORY—BA 6/4—A. C. Spark Plug Div., General Motors Corp., 1300 N. Dart Hy., Flint, Mich., 1 story, 336x400 ft., concrete, steel, brick, stone factory addn. $1,500,000. Argonault Realty Div., 485 W. Milwaukee Ave., Detroit, Mich., engr.-archt.

▲ **Mich., River Rouge**—HOUSING—BA 6/5—City, William M. Ducan, dir. Pub. Housing Comn., 100 housing units, $1,300,000. Arthur Greig & Assocs., 10538 W. Jefferson Ave., archts. CD 5/9/56.

Ind., Gary—SCHOOL—BA 6/5—Trustee Office, Bd. Educ., 524 Garfield St., 1 story, 80x360 ft. and 75x200 ft., masonry, Ivanhoe Elementary School. $500,000. Plans deposit $20. Joseph A. Martin & Assoc., 1132 Aetna St., archts. R. J. Abramson & J. M. Klipp, 537 S. Dearborn St., Chicago 5, Ill., engrs. CD 1/30.

Wis., Wauwatosa—SCHOOL—BA 6/17—Bd. Educ., 1732 Wauwatosa Ave., 2nd unit of Madison School. $609,000. Ebling, Plunkett & Keymar, 1220 N. Milwaukee St., Milwaukee, Zone 2, archts. CD 8/29/56.

O., Gallipolis—HOSPITAL—BA 6/18—Ohio State Dpt. P. Wks., 705 Ohio Dpts. Bldg., Columbus, 100 bed medical and surgical bldg., at Gallipolis State Hospital, for Dpt. Mental Hygiene & Correction. $750,000. Plans deposit $25. Ramsey, Croce & Abbott, 490 City Park Ave., Columbus, archts. CD 5/4/56.

HEAVY CONSTRUCTION—LB & CA

▲ **Miller-Thompson Constr. Co.,** 20958 Grand River, Detroit 19, Mich., CA $1,058,000. Contr. PW 2128 (B1) substructure Woodmere Pumping Station, Patton Park, DETROIT, MICH. City, Glenn C. Richards, Comr. Dpt. P. Wks., 528 City-County Bldg., Detroit, Mich. Bids Apr. 2. CD 4/9, under LB, under Water Supply.

BUILDINGS—LB & CA

Marcuson Builders, 5703 Curtis Ave., Cleveland 3, O., CA Est. $750,000, HOME addns., imprvs., CLEVELAND HEIGHTS, O. Montefiore Home, 3151 Mayfield Rd., Cleveland, 18, O. CD 3/8/57.

▲ **Roy C. Clark, Inc.,** 804 E. Chicago Ave., East Chicago, Ind., LB $2,033,504 2 story INDIANA UNIVERSITY exten. and drainage 33 Ave. and Jefferson St. in S. Gleason Park, GARY, IND. Indiana University, Administration Bldg., Bloomington, Ind. Bids May 9. CD 4/8.

▲ **Morrison Constr. Co.,** 1834 Summer St., Hammond, Ind., CA $1,000,000. Oil Processing PLANT, CONTROL BLDG., COMPRESSION BLDG. and STORAGE BLDG., S. Kedzie Ave., BLUE ISLAND, ILL. Clark Oil & Refining Co., 13100 S. Kedzie Ave., Blue Island, Ill. Dushell Eng. Co., Inc., Wichita, Kan., engr.

Seco Constr. Co., 2323 W. 47th St., Chicago, Ill., CA $750,000, 5 story interns and physicians RESIDENTIAL BLDG., 2700 W. 15th Pl., CHICAGO, ILL. Mt. Sinai Hospital, 2750 W. 15th Pl., Chicago, Ill. Bids Feb. 28. CD 1/31.

Young & Sons Constr. Co., Inc., 1244 E. 79th St., Chicago, Ill., LB $720,193, 2 story, brick, Beale ELEMENTARY SCHOOL, 6043 S. Sangamon St., CHICAGO, ILL. Bd. Educ., 228 N. LaSalle St., Chicago, Ill. Bids May 13. CD 4/30/57.

Jos. T. Carp, Inc., 5640 N. Northwest Hy., Chicago, Ill., CA $700,000, 1 story, 73,000 sq. ft. brick OFFICE-WAREHOUSE, Taylor St. between Jefferson and DesPlaines, CHICAGO, ILL., Murphy & Miller, Inc., 1326 S. Michigan Ave., Chicago, Ill. W. Fred Dolke, 189 W. Madison St., Chicago, Ill., archt. CD 4/26.

▲ **O. W. Burke Co.,** 1032 Fisher Bldg., Detroit, Mich., CA Est. $1,900,000, 2 story, bsmnt, 80 x 90 ft. EXCHANGE BLDG. 1 story, 24 x 75 ft. WING, Rochester Rd. near 15 Mile Rd., TROY, MICH. Michigan Bell Telephone Co., 1365 Cass St., Detroit, Mich. Smith, Hinchman & Gryils, Inc., 800 Marquette Bldg., Detroit, Mich., archt.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲† **Mo., Grandview**—RESURFACING—BA 6/24—U. S. Eng., Federal Bldg., Kansas City, Mo. removing present pavement, new grades covering 6,000x150 ft., rein.-con. N-S Runway, Grandview Air Force Base, $1,200,000. Extended date. CD 4/26.

BUILDINGS—BA

▲ **Iowa, Dubuque**—SCHOOL—BA 6/26—Catholic Parishes of City of Dubuque, 2909 Kaufmann Ave., Dubuque, Central Catholic High School. $3,200,000. Extended date. Durrant & Berquist, 666 Loras Blvd., archts. CD 4/26.

BUILDINGS—SLC

▲ **Iowa, Davenport**—SCHOOL—Catholic Diocese of Davenport, Most Rev. Ralph L. Keyes, Bishop and Rt. Rev. Msgr. Thomas J. Fenney, pastor, Sacred Heart Cathedral, Davenport, soon lets contract high school $2,000,000. William F. Bernbrook, 1630 5 Ave., Moline, Ill.,

HEAVY CONSTRUCTION—LB & CA

▲ **Rue & Sorenson,** Fargo, N. D., CA $2,257,000 (3 bidders) trunk sewers, incl. A, about 28,425 lin. ft.; B, about 24,350 lin. ft.; c, 25,025 lin. ft. ST. LOUIS PARK, MINN. Village, J. Justad, clk., St. Louis Park, Minn. Bids May 13. CD 4/25.

† **Cage Bros.,** 6959 San Pedro St., San Antonio, Tex., LB $922,537. constr. Proj. 1-A, 1-B, 2-C (bridges) North Entrance and Rio Grande Rds., 2.309 mi. Big Bend National Park, south of Marathon, TEXAS. Bureau P. Rds., Dpt. Interior, Supt. Commerce, Room 252, Denver Fed. Center, Denver, Colo. Bids May 7, CD 4/11.

BUILDINGS—LB & CA

▲ **Sheehy Constr. Co.,** 1255 Larpenteur Ave. West, St. Paul, Minn., CA $1,209,400 general contract, MEN'S RESIDENCE HALL, on Minneapolis campus, MINNEAPOLIS, MINN. Regents, University of Minnesota, 404 Admin. Bldg., Minneapolis, Minn. Bids May 8. CD 5/13, under LB.

Hathman Constr. Co., Hathman Bldg., Columbia, Mo., CA $894,000. brick, steel rein.-con. HICKMAN HIGH SCHOOL addn., COLUMBIA, MO. Bd. Educ., Jos. Saunders, secy., Rangeline Rd., Columbia, Mo. Bids Apr. 30. CD 5/10, under LB.

Jansen Constr. Co., 1203 Powhattan St., Dallas, Tex., LB $834,000 Base Bid, Sarah Zumwalt Junior High School for Negroes, DALLAS, TEX. Dallas Independent School Dist., 3700 Ross St., Dallas, Tex. Bids May 7. CD 4/23.

▲ **H. W. Houston,** Pueblo, Colo., CA $1,570,000. general contract 1 story, 164,000 sq. ft. Northeast HIGH SCHOOL, PUEBLO, COLO. Bd. Educ., School

Brookfield, Wis. high school gymnasium Rilco Arches 100'- 4" in span are spaced 22'-9" O.C. Architects: Grassold-Johnson and Associates, Milwaukee. Contractor: Klug and Smith Company, Milwaukee.

The shortest line in terms of both days and dollars is the Rilco line. Because all Rilco laminated members — like these arches and purlins — are cut, shaped and drilled at the factory. At the jobsite they fit — your regular crews can erect them *fast* — save you expensive time and money.

Rilco custom-builds trusses, beams, arches, deck — and each member is engineered to fit easily.

Rilco engineers are constantly developing new ideas, new shortcuts for fast erection — to help you save time and money. These shortcuts — yours for the asking — can help you bid and get jobs, complete them on time and make a profit. For more information write . . .

FREE

Write for Free Booklet on Wood Laminated and Fabricated Solid Timbers

RILCO works wonders with wood

RILCO LAMINATED PRODUCTS, INC.

W-801 First National Bank Building • St. Paul 1, Minnesota

District Offices: Newark, N. J., Fort Wayne, Ind., Tacoma, Wash.

Dist. No. 50, 102 W. Orman Ave., Pueblo, Colo. Bids May 1, awarded May 8. CD 5/14, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

▲† **Calif., Miramar**—BARRACKS—BA 6/14—P. Wks. Office, Eleventh Naval Dist., San Diego, enlisted mens barracks, third increment at Naval Air Station, Spec. 7415-56, $1,200,000. CD 10/10/55.

▲† **Calif., San Diego**—HANGAR, etc.—BA 6/18—P. Wks. Office, Eleventh Naval Dist., San Diego, hangar and aircraft parking area at Naval Ordnance Test Station China Lake, Spec. 7413-56. $4,350,000. CD 8/27.

BUILDINGS—BA

▲† **Idaho, Arco**—BUILDINGS—BA After 5/22— U. S. Atomic Energy Comn., Idaho Operations Office, P.O. Box 1221, Idaho Falls, building, utilities, facilities at Spert II area, National Reactor Testing Station, AT (10-1)-887. $1,300,000. CD 5/17.

▲ **Wash., Seattle**—LIGHT—BA 6/26—Bd. P. Wks., City-County Bldg., 7 story city light bldg. addn. $3,200,000. CD 6/15.

HEAVY CONSTRUCTION—LB & CA

CALIFORNIA—State Dpt. P. Wks., 1120 N. St., Sacramento,
A. Teichert & Son, 1931 Stockton Blvd., Sacramento, Calif., CA **$906,383.** grading, surf. 5.4 mi. Sign Rte. 32 and constr. 2 bridges between Chico and 0.6 mi. north of Hog Springs, Butte Co., Bids May 1, awarded May 10, CD 5/8, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, Bids opened 5/16,
Griffith Co., 1060 S. Broadway, LB **$3,161,807** (7 bidders) hy. imprvs. 3.6 mi. 6 lane divided freeway on new alignment between State Rte. 174 and 0.2 mi. east of U. S. 101 in cities of Anaheim and Fullerton, Orange Co., (VII-Ora-175-A, Ana, Ful) CD 4/19.

▲† **Pacific Dredging Co. & Franks Dredging Co.**, 14409 S. Paramount Blvd., Paramount, Calif., CA **$1,240,000.** dredge Mission Bay, Quivera Basin and Main Channel, San Diego River, ENG-04-353-57-39, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 1. CD 5/14, under LB.

▲ **North Bay Constr. Co & Rapp, Christensen & Foster**, 560 Boyd St, Santa Rosa, Calif, LB **$1,649,450** (joint venture) sewage treatment plant and appurtenant facilities, VALLEJO, CALIF Vallejo Sanitation & Flood Control Dist., c/o 450 Rider St., Vallejo, Calif. CD 4/5.

BUILDINGS—LB & CA

▲ **P. Cook Constr. Co.**, 307 Cresent Dr., Yakima, Wash., CA Est. **$1,000,000**, 1 story, part bsmnt. CLUB BLDG., YAKIMA, WASH. Y.M.C.A., 6 S. 4th St., Yakima, Wash. J. W. Maloney, Central Bldg., Seattle 4, Wash., archt. CD 3/25.

▲ **James I. Barnes Constr. Co.**, 1119 Montana Ave., Santa Monica, Calif., LB **$1,727,000** (3 bidders) general work, FINE ARTS BLDG., INDUSTRIAL ARTS BLDG. and site development at Los Angeles State College of Applied Arts & Sciences, San Bernardino Freeway Campus, LOS ANGELES, CALIF. State Div. Architecture, 1100 S. Grand Ave., Los Angeles, Calif. Bids May 15. CD 4/15;
E. Willardson, Inc., 2880 Rowena Ave., Los Angeles, Calif., LB **$504,679** (7 bidders) mechanical work, (Los Angeles, Calif.).

▲ **Williams & Burrows**, 500 Harbor Rd., Belmont, Calif., CA **$2,500,000.** 100,000 sq. ft. OFFICE BLDG. and 20,000 sq. ft., brick, structural steel LABORATORY BLDG., MENLO PARK, CALIF. Stanford Research Institute, Stanford Village, Menlo Park, Calif. Bids Mar. 15. CD 2/19.

▲ **Carl N. Swenson**, 1095 Stockton Ave., San Jose, Calif., LB **$1,822,000.** general contract, rein.-con. walls and floors for hospital care and nursing wings, PALO ALTO, CALIF. Stanford University, Palo Alto and City of Palo Alto, City Hall, Palo Alto. Bids May 10;
Rothchild, Raffin & Weirick, 274 Brannon St., San Francisco, Calif., LB **$574,500.** cabinets, etc. (Palo Alto, Calif.);
A. E. Knowles, 3330 San Bruno Ave., San Francisco, Calif., LB **$388,390.** plastering (PALO ALTO, CALIF.)
Scott Co., 243 Minna St., San Francisco, Calif., LB **$1,836,300.** plumbing, heating and mechanical (PALO ALTO, CALIF.);
Marshall Electric Co., 1701 Industrial Rd., San Carlos, Calif., LB **$774,717.** electrical work (PALO ALTO, CALIF.).

▲ **Craft Constr. Co.**, 2812 San Guinetti Lane, Stockton, Calif., LB **$1,299,760** (8 bidders) 3 story wood frame brick veneer WOMENS DORMITORY, STOCKTON, CALIF. College of the Pacific, c/o President, N. Pacific Ave., Stockton, Calif. Bids May 15. CD 4/23.

CANADA

BUILDINGS—SLC

▲ **Ont., Toronto**—WAREHOUSE—Lever Bros. Ltd., 299 Eastern Ave., soon lets contract, 1 story, no bsmnt., 300x500 ft. warehouse, Keating St. and Don Roadway. $1,000,000. CD 4/16.

BUILDINGS—LB & CA

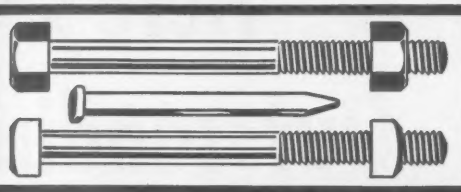
▲ **T. A. Andre & Sons Ltd.**, 580 Brock St., Kingston, Ont., CA **$1,000,000.** 3 story, bsmnt., 60x230 ft.,

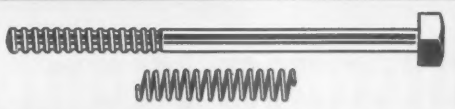
(Continued on page 96)

HOT DIP GALVANIZED OR BLACK
HARDWARE
FOR HEAVY CONSTRUCTION

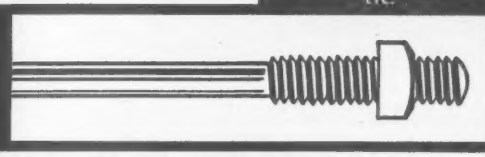
Made to your specifications of: Steel or Genuine Wrought Iron.

Shipped TODAY If Necessary



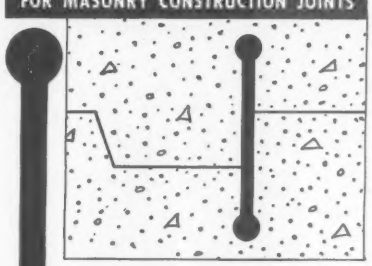


BOLTS, SCREW ANCHORS, TIE RODS, UPSET RODS, STRAPS, WASHERS, STAPLES, DOCK SPIKES, MANHOLE HARDWARE, ETC.



JERSEY BOLT & SPIKE CORPORATION
MANUFACTURERS • FABRICATORS
Plant and Main Office: 9 Lister Avenue, Newark 5, New Jersey
Direct lines: New Jersey MArket 3-0333 New York REctor 2-3958

RUBBER
WATERSTOPS
FOR MASONRY CONSTRUCTION JOINTS



Williams Efficiency Waterstops are made from Natural Rubber Stock, and designed for maximum effectiveness in any type of cast-in-place construction joint. They will bend around corners—will not tear from shear action. Tensile Test: 3990 lbs.; Elongation Test: 650%. Available in rolls up to 80 feet in length. Field splicing is simple. Williams Waterstops can also be furnished in Neoprene for industrial uses where resistance to oil and other injurious wastes is desirable. These highly effective Waterstops are now in use in hundreds of industrial plants, commercial and public buildings throughout the country.

See Sweet's, or Write for Information.

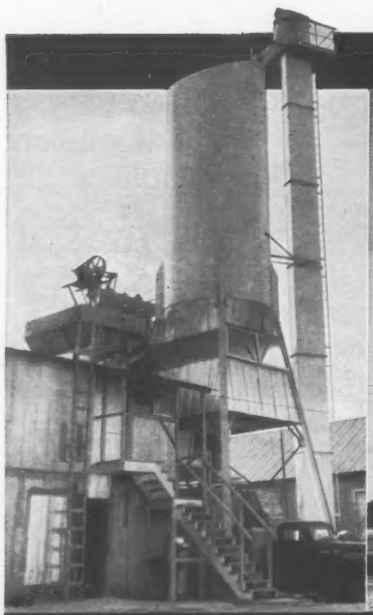
WILLIAMS
EQUIPMENT and SUPPLY CO.
6001 E. McNichols Rd., Detroit 12, Mich.

TEST BORINGS
for
• COAL
• MINERALS
• DAMS & BRIDGES
• BUILDINGS
We Bore into the Earth
PENNSYLVANIA Drilling CO.
DRILLING CONTRACTORS AND MFRS.
PITTSBURGH 20, PA.

PHOENIX BRIDGE COMPANY
Engineers—Fabricators
Erectors
Structural Steel
BRIDGES and BUILDINGS
General Office and Shops
PHOENIXVILLE, PA.
Subsidiary—Barium Steel Corporation

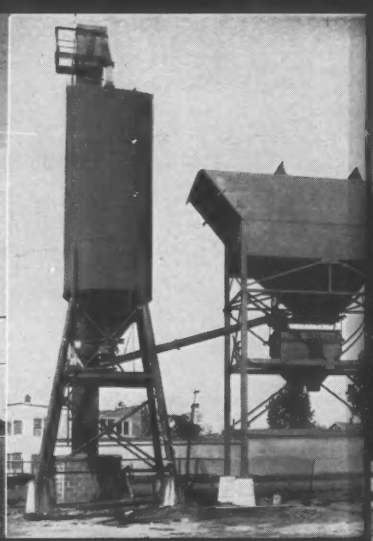
Here's the Nation's Outstanding Bulk Cement Batching Plant Offer

Long known to be the best engineered plant, increased demand for the Heltzel E-3, has resulted in production economies you'll want to know more about



Standard 609 BBl. E-3 Plant provides low cost, large capacity bulk cement operation for Georgia ready mix firm.

Large Indiana highway paving contractor finds his E-3 Plant with recirculator gives him maximum portability, capacity and speed.



New Jersey ready mix operator teams the E-3 with Heltzel's rugged type 200 Aggregate Plant for fastest one-stop batching service.

Illinois paving contractor uses the Heltzel E-3 with extra large ground cement storage to provide high speed batching for modern paving operation. Note piers for addition of third 1000 BBl. re-circulator.

Ohio paving contractor selected this E-3 with recirculator after comparing with several other makes. He reports the plant is most versatile, fast and exceedingly accurate.

● The Heltzel E-3 Bulk Cement Plant has long been recognized as the industry's finest engineered plant. Now, because of an increased demand, Heltzel has set up a new production facility that has resulted in economies that enable us to offer this outstanding plant at standard equipment prices.

There is absolutely no quality reduction! You get the all butt-welded bin with rounded corners (fabricated by an automatic welding process) that assures smooth flow and guarantees water tightness. You have your choice of Heltzel's patented tubular valves—with or without rotary vane feed. The rugged wide flange, flare-leg supports that mean extra rigidity and truck room! All connections are out in the open, easily accessible for fast, easy erection or dismantling.

Select your capacity—from 250 BBls to 670 BBls—portable recirculators up to 1000 BBls each. Choose your batcher-manual, semi- or fully automatic from 16 to 60 cubic feet including the outstanding Heltzel Twin Batcher designed for high production paving operations. Plants available with "unitized construction" — factory assembled in units for even faster erection and dismantling.

Whatever your needs you will want to get all the facts on this exceptional offer before you buy. Contact your Heltzel representative—or write direct.

THE HELTZEL STEEL FORM AND IRON CO., 420 THOMAS RD., WARREN, OHIO

GOT A PRODUCT?

That needs . . . . FINANCING? ENGINEERING? MANUFACTURING? MERCHANDISING?

We are looking for a new product—and we'd like to find one in the construction industry. If you have a product, an idea for one or a small plant now in production, it might be to your advantage to contact us.

We are a multi-million dollar company recognized as one of the foremost facilities in the aircraft industry. We have the engineering talent, financial position, manufacturing facilities and merchandising know-how to put a good product on the market.

What's in it for us? Needed product diversification. Write Dept. GH-1, The CLEVELAND PNEUMATIC TOOL COMPANY, 3781 East 77th Street, Cleveland 5, Ohio.

construction

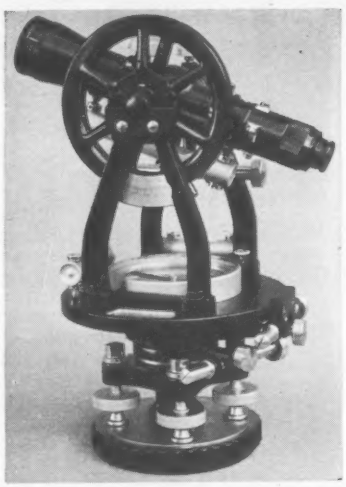
STEEL

EVERY KIND IN STOCK IMMEDIATE SHIPMENT

REINFORCING BARS and accessories
STRUCTURALS—channels, angles, beams, etc.
PLATES—many types including Inland 4-Way Safety Plate
SHEETS—many types & coatings
TUBING—incl. welded structural
WIRE MESH—all standard sizes
EXPANDED METAL—std. & flattened
STEEL SPIRALS, CAISSON RINGS, ETC.

RYERSON

Joseph T. Ryerson & Son, Inc. Plants at: New York • Boston • Wallingford, Conn. Philadelphia • Charlotte, N. C. • Cincinnati Cleveland • Detroit • Pittsburgh • Buffalo Chicago • Milwaukee • St. Louis • Los Angeles • San Francisco • Spokane • Seattle



UMECO 4-5/16" UTILITY TRANSIT
Model 115

PRECISE • RUGGED • RELIABLE
FULLY GUARANTEED

Complete line of transits, levels, compasses, planimeters. Folder on request.

UMECO OPTICAL DIVISION
465 California San Francisco, Calif.

• • • •

Represented on West Coast by:
A. Lietz Company
840 Post, San Francisco • 1224 S. Hope, Los Angeles

(Continued from page 93)

steel, concrete University HOSPITAL, KINGSTON, ONT. Queen's University Bd. Trustees, Kingston, Ont. CD 4/1.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **VENEZUELA**—Ministry P. Wks., Caracas, Empresa Nacional de Edificaciones, Carreteras y Asfalto, S. A., Toore a Vercas, 25, Caracas, Venezuela, CA $2,812,153, 1,650 lin. ft. tunnel at LaCabrerea, on Caracas-Valencia Hy. CD 5/8/56.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

† **Grand Constr. Co.**, Madrid, Spain, LB $879,000. MOR-42, service club bldg., Spanish contractors only, MORON, SPAIN. Bureau Yards & Docks, Dpt. Navy, 18 and Constitution Ave. N.W., Wash. 25, D. C., U.S.A. Bids Apr. 3.

PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ **Kan., Mission**—Turkey Creek Sewer Dist., 6915 Johnson Dr., 9,000 acre sewerage system and treatment plant. $3,000,000. Black & Veatch, 1500 W. Meadow Lane, Kansas City, Mo., consult. engrs. CD 10/21/53, under Kan., Shawnee.

▲ **N. Y., Mineola**—Nassau County Executive, Nassau Co., Old County Court House, Mineola, voted bonds sewers in Roosevelt-Union Sewage Collection Distr., $6,000,000; sewers in New Hyde Park Sewage Collection Distr., $1,900,000; sewers in Floral Park Sewage Collection Distr., $100,000; sewers in Lido Beach Sewage Collection Distr., $1,305,000.

▲ **N. Y., Rockaway**—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, Proj. PW 55A, Rockaway Pollution Control Project exten., sewage treatment works addns. $3,260,000. Metcalf & Eddy, 1300 Statler Bldg., Boston 16, Mass., consult. engrs. To go ahead 1961-1962.

▲ **Pa., Harrisburg**—City, City Hall, incinerator plant. $1,500,000.

BRIDGES

▲ **GEORGIA**—State Hy. Dpt., 2 Capitol Sq., Atlanta, DeKalb Co.—Moreland Ave. Underpass, $2,000,000. CD 2/12/47.

STREETS AND ROADS

▲ **GEORGIA**—State Hy. Dpt., 2 Capitol Sq., Atlanta, Clayton Co.—Red Oak to Forest Park segment of Atlanta Circumferential route, $8,500,000-$9,000,000. DeKalb Co.—Stone Mountain Bypass tie-in with U. S. 78, $5,000,000.

relocation of Atlanta-Augusta State Rte. 12, $19,800,000.

Fulton Co.—Doraville to New Buford Hy. segment of Atlanta Circumferential route, $2,500,000;

new State Farmer's Market access road $1,500,000;

Atlanta expressway connector from Baker to Richardson Sts., $19,000,000.

▲ **O., Cleveland**—Comrs., Cuyahoga Co., Court House, Zone 13, widen. Wilson Mills Rd. to 4 lanes from Richmond Rd. east to SOM Center Rd., Richmond Heights, Highland Heights and Mayfield, $2,225,000. First section from Richmond to Lander scheduled for 1958 and section from Lander to SOM for 1959. CD 11/10/55.

▲ **ALBERTA**—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont.

Banff—reconstr. sections of Banff-Jasper Hy., Banff and Jasper National Parks, $3,000,000.

grading, base course, stab. base course, prime coat, bridges and overpasses in Banff National Park $5,200,000.

▲ **BRITISH COLUMBIA**—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont.

Field—grading, base course, stab. base course, prime coat, bridges and overpasses Trans-Canada Hy. in Yoko National Park, $2,265,000.

Glacier Co.—clearing, grubbing, right-of-way Trans-Canada Hy. in Glacier National Park $1,100,000;

Revelstoke—clearing, grubbing, right-of-way Trans-Canada Hy. in Revelstoke National Park $400,000;

Windemere—widening and reconstr. Banff-Windemere Hy. Banff and Kootenay National Parks, $3,105,000. CD 7/21/43.

▲ **NOVA SCOTIA**—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont.

Ingonish—widening and reconstr. Cabot Trail Cape Breton Highlands National Park $1,000,000.

▲ **Que., Shawinigan Falls**—City, City Hall, street and lane paving, $1,000,000, P. E. Delisle, city engr. CD 4/7/54.

EARTHWORK, WATERWAYS

▲ **Ohio**—Ohio State Dpt. P. Wks., State Depts. Bldg., Columbus, lake on Caesar's Creek, near Jamestown, Greene Co., $500,000; 1,800 acre lake extending into parts of Fayette and Pickaway Counties, $640,000. CD 11/3/43.

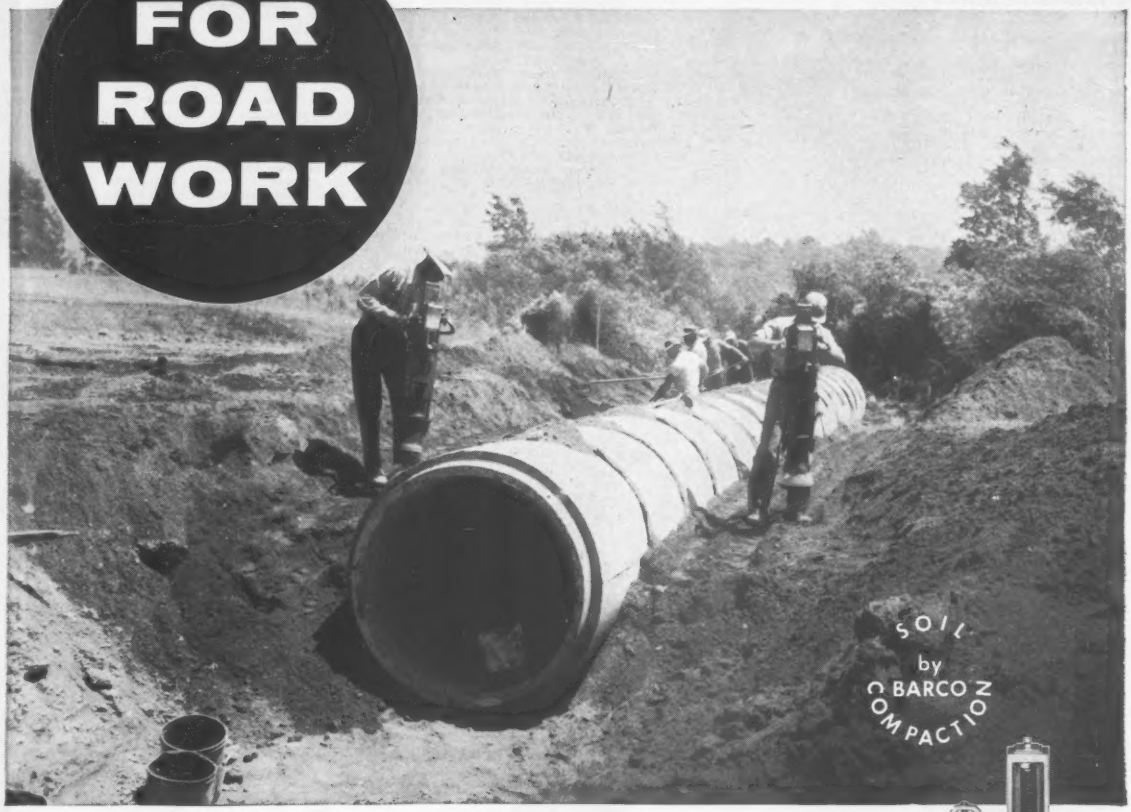
AIRPORTS

▲ **N. J., Trenton**—RUNWAY—Bd. Freeholders, Mercer Co., Court House, exten. Runway 24 incl. elimination of Scotch Rd. and construc. new 2 mi. road and re-

(Continued on page 98)

FOR ROAD WORK

Tamping fill around 4 ft. concrete pipe culvert on New York State Thruway Extension near West Seneca, N. Y. The Barco Rammers are owned by S. J. Groves & Sons Co., Syracuse, N. Y. (Photo: CONSTRUCTIONEER)



Barco Rammers are Essential!

CHECK THE RECORDS for *soil compaction* on every top ranking highway, toll road, thruway, or freeway built in recent years and you will find Barco Rammers! Here are the reasons:

The key to better construction—

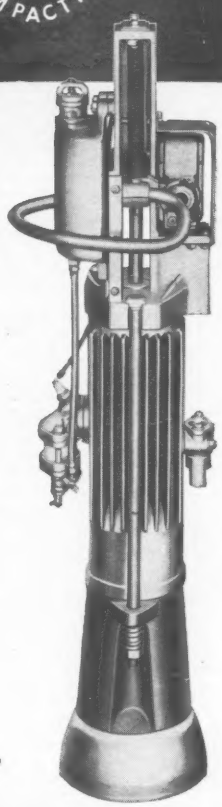
No modern trend in construction has had a more phenomenal growth than the specification of HIGH DEGREE SOIL COMPACTION for all kinds of projects for longer life and better value.

Easily meet rigid specifications—

In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method)—EASILY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially useful for compacting fill in restricted areas. ONLY the Barco Rammer can produce specified high degree compaction on lifts up to 20 inches.

Get jobs finished on time—

One of the biggest advantages offered by Barco Rammers is ability to handle work in minimum time. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour. Ask for a demonstration.



FOUNDED 1908
BARCO
PRODUCTS BACKED BY EXPERIENCE

BARCO MANUFACTURING CO.
514-FF **Hough St., Barrington, Ill.**
BARCO RAMMER
for High Degree Soil Compaction
BARCO VIBRA-TAMP
for Granular Fill and Bituminous Surfacing

(Continued from page 96)

lated imprvs. to Mercer County Airport, $1,050,000. CD 5/16/56.

PUBLIC BUILDINGS

▲ **Calif., Grossmont**—HOSPITAL—Grossmont Hospital Dist., bond election June 11, Grossmont hospital addn. $1,800,000.

▲ **Conn., Bloomfield**—SCHOOL—Town, Town Hall, plans by Russell & Gibson & Assocs., 1005 Farmington Ave., West Hartford, Junior High School. $1,000,000. CD 6/20.

▲ **Conn., Naugatuck**—HIGH SCHOOL—Town, Town Hall, plans by Sherwood, Mills & Smith, 65 Broad St., Stamford, high school. $2,000,000. CD 1/4/55.

▲ **Conn., Windsor**—SCHOOL—Town, Town Hall, plans by Louis J. Drakos, 998 Farmington Ave., West Hartford, Junior High School, Center Dist. $1,500,000. Robert W. Loomis, 32 Maple Ave., consult. engr. Henri B. Van Zelm & Assocs., 1007 Farmington Ave., West Hartford, staff engrs. CD 4/18.

▲ **Fla., Miami**—HOSPITAL WING, etc.—Bd. Comn. Dade Co. Courthouse, plans by Steward-Skinner Assocs., 223 SE 1st St., Jackson Memorial Hospital patient wing to central bldg., emergency bldg., morgue bldg., addns to other units, NW 10 Ave. and NW 10th St. $1,500,000. CD 11/9.

▲† **Idaho, Idaho Falls**—REACTOR, etc—Atomic Energy Comn., Idaho Operations Office, Idaho Falls, 60x92 ft. reactor bldg., reactor vessel, piping, coolant sys., electrical power sys., storage tanks, etc. for Spert II facility, $1,300,000. Bids late this month; installing monitoring sys. in operations area, $20,000; 88x102 ft., mezzanine floor rein.-con maintenance shop addn., in Materials Test Reactor and Eng. Test Reactor for National Reactor Testing Station, $50,000. Bids about June 1. CD 3/24/49.

▲ **Ill., Chicago**—FIREMANS ACADEMY—City, City Hall, multi-story brick firemans academy, Des Plaines, Clinton, Taylor and Jefferson Sts. $1,500,000. CD 6/11/45.

▲† **Ill., Great Lakes** — SCHOOL — Ninth Naval Dist., Great Lakes Naval Training Station, Great Lakes, plans by Sargent & Lundy, 140 S. Dearborn St., Chicago, Machinist Mates Boilerman School, Naval Training Center, $2,700,000. CD 6/28/51.

▲ **Ill., Wauconda**—SCHOOL—Wauconda Twp. High School Dist. 118, McHenry Rd., plans by Raymond Orput & Assoc., Empire Bldg., Rockford, high school, Rte. 12 N. of Hubbard Woods; grade school addn., McHenry Rd., Wauconda, $1,175,000.

▲ **Mich., Sparta** — SCHOOL — Bd. Educ., Sparta Area Schools, Sparta, plans by Guida A. Binda & Assoc., 231 Capital Ave., Battle Creek, high school. $1,300,000.

▲ **Minn., Ely**—SCHOOL—Bd. Educ., Isabel F. Koshi, clk., voted $1,300,000 bonds Apr. 25, elementary school and a connecting bldg. to house the Junior College, to go ahead 1957.

▲ **Minn., New Hope (P. O. Robbinsdale)**—SCHOOL—Bd. Educ., Independent School Dist. No. 24, F. C. Bayard, clk., plans by Bissell & Belair, 1111 Nicolett Ave., Minneapolis, Junior High School, $1,500,000. May start constr. this year.

▲ **Minn., Wayzata**—SCHOOL—Bd. Educ., J. J. Kardong, clk., voted $1,075,000 bonds Apr. 30, 24 classroom school bldg. and remodeling two other schools, etc. Haarstick, Lundgren & Assocs., N. 212 1st Nat'l. Bank Bldg., St. Paul, archts. CD 4/24.

▲ **Minn., Willmar**—SCHOOL—Bd. Educ., A. W. Wishess, clk., voted $1,987,000 bonds May 7, new Senior High School, $1,687,000; and grade school addn. $300,000. Bissell & Belair, 1111 Nicolett Ave., Minneanolis, archts. To go ahead 1957. CD 4/26.

▲ **Mo., Higginsville**—DORMITORY, etc.—Missouri State School for Feeble-Minded & Epileptics, plans by Kivett, Myers & McCallum, 1016 Baltimore Ave., Kansas City, Mo., dormitory and utilities. $1,500,000. CD 2/17/53.

▲ **Mo., St. Louis**—CLINIC and ADMINISTRATION—St. Louis State Hospital, Dr. Louis H. Kehler, supt., 5400 Arsenal St., Zone 9, plans by Marcel Boulicault, 411 North 7th St., Zone 1, clinic and administration bldg. $5,200,000. CD 2/1/56.

▲ **Mo., St. Louis County**—BUILDINGS—St. Louis State Training School for Feeble-Minded, Dr. S. S. Hines, supt., Bellefontaine and Hall Rds., plans by Burth-Wirth Co. & Assocs., 705 Chestnut St., St. Louis, Zone 1, and Lester O. Roth, archt., 4341 Chippewa St., St. Louis, Zone 16, dormitories and custodial wards; a storehouse and garage bldg. $1,400,000. CD 3/23/56.

▲ **N. Y., Douglaston**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, P.S. 227, Horace Harding Blvd. and Douglaston Parkway, Proj. E 397. $2,450,000. to go ahead in 1960.

▲ **N. Y., Laurelton**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, Junior High School 231, Laurelton-Rosedale Area, Proj. E 417, $3,600,000. To go ahead in 1959.

▲ **N. Y., New York**—SCHOOL—Bureau Contr. Bd. Educ., 42-15 Crescent St., Long Island City, P.S. 23, 165 St., Tinton and Union Aves., Proj. E-427, $1,880,000. To go ahead after 1957.

▲ **N. Y., New York**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, P.S. 51, 158 St. and Jackson Ave., Proj. E-349, $1,460,000. To go ahead after 1957.

▲ **N. Y., New York**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, Junior High School 52, Kelly St. near Ave. St. John, Proj. E-835, $1,200,000. To go ahead in 1958.

▲ **N. Y., New York**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, Junior High School 136, Prospect Ave. and Jenning St., Proj. E-907, $3,300,000. To go ahead in 1958.

▲ **N. Y., New York**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, Junior High School 142, E. 233 St. and Baychester Ave., Proj. E-916, $3,775,000. To go ahead in 1958.

▲ **N. Y., New York**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, P.S. 83, Rhinelander and Bogart Aves., Proj. E-351. $1,100,000. To go ahead after 1957.

▲ **N. Y., Riverhead**—SCHOOLS—Bd. Educ., Riverhead, plans by George J. Dippell, 124 Merrick Rd., Massapequa, 3 new elementary schools. $3,000,000.

▲ **N. Y., Rockaway Beach**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, P.S. 105, Beach 49 St. and Elizabeth Ave., Proj. E-360, $2,354,500.

▲ **N. Y., Rockaway Beach**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, P.S. 225, vicinity of Rockaway Beach Blvd. and Beach 110 St., Proj. E 365. $2,400,000. To go ahead in 1960.

▲ **O., Kent**—SCHOOL—Bd. Educ., Lewis L. Burkhart, supt. Schools, Kent, voted $650,000 bonds May 7, high school. $1,530,000. CD 3/13.

▲ **O., Marlboro** — SCHOOL — Marlington School Dist., Marlboro, defeated bonds, high school. $1,140,000. CD 1/24.

▲ **O., Newark**—SCHOOLS—Newark Bd. Educ., Newark, voted bonds May 7, 3 new elementary schools and 1 new high school. $4,830,000. CD 2/6.

▲ **O., Warren**—JAIL, etc.—Comrs. Trumbull Co., County Court House, bond election Nov. 5, jail and office bldg. $1,800,000. CD 11/12.

▲ **Wash., Sedro Woolley**—JUNIOR COLLEGE—Union High School Dist. No. 1, constr. Junior College. $1,144,080, $469,000 bond election May 14, Work might start this fall.

COMMERCIAL BUILDINGS

▲ **Calif., Castro Valley**—APARTMENT, etc.—Harry Krohl, c/o F. M. Cranston, archt., 7716 Castro Valley Blvd., apartment house development, incl. swimming pools, vicinity Eden Twp. $1,000,000.

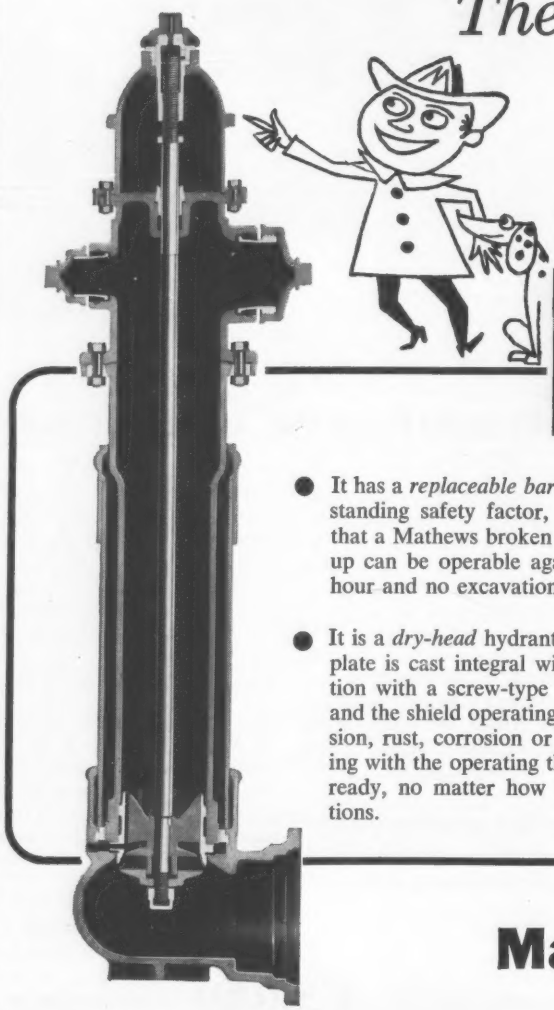
▲ **Calif., Oakland**—TABERNACLE—Church of Jesus Christ Latter Day Saints, Vine and Walnut Sts., Berkley, Mormon Tabernacle. $1,500,000.

▲ **Calif., San Francisco**—SERVICE—Bank of America, 300 Montgomery St., 4 story, 200,000 sq. ft. floor space, service bldg. $5,500,000.

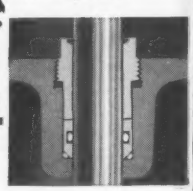
▲ **Calif., San Mateo**—OFFICE—Fifth Ave. Corp., c/o Austin Co., archt., 16112 Euclid Ave., Cleveland, O., office bldg. center, incl. several office bldgs., Fifth Ave. and El Camino Real, $10,000,000.

MATHEWS

The finest



O-Ring seal available when specified



- It has a *replaceable barrel*. This is an outstanding safety factor, because it means that a Mathews broken in a traffic smash-up can be operable again within half an hour and no excavation is necessary.
- It is a *dry-head* hydrant. The stuffing box plate is cast integral with the nozzle section with a screw-type stuffing box. This and the shield operating nut prevent abrasion, rust, corrosion or ice from interfering with the operating thread. It is always ready, no matter how severe the conditions.

Made by

▲ **Calif., Sausilito**—HOTEL—Grace Management Corp., c/o John L. King, archt., 255 Kearney St., San Francisco, hotel development, incl. boat dock, swimming pool, etc. $1,500,000.

▲ **Calif., Tiburon**—APARTMENT DEVELOPMENT, etc.—Latipac, Inc., c/o Steven M. Heller, archt., Pier 18, San Francisco, 30 acre marina and apartment development, $1,700,000.

▲ **Fla., Miami**—APARTMENTS—Daniel Kelly (builder), 69 and Walnut Sts., Phila., Pa., fourteen 40-unit apartment bldgs., 32 acres on Key Biscayne, $3,000,000.

▲ **Fla., Miami**—OFFICE—Ferre Enterprises, Jose Ferre chn., c/o Pancoast, Ferendino, Skeels & Burnham, archts., 927 Arthur Godfrey Rd., Miami Beach, 26 story, rein.-con. office bldg., SE 3rd and 4th St., east of SE 2nd Ave. $10,000,000. Obler & Clarke, 927 Arthur Godfrey Rd., Miami Beach, consult. engrs.

▲ **Fla., Miami**—SHOPPING CENTER—Northside Center, Inc., L. Allen Morris, pres., c/o Weed, Russell, Johnson Assocs., archts., 550 Brickell Ave., Arthur Vining Davis Shopping Center, 750,000 sq. ft. floor space parking areas, 4,000 cars, on 50 acres NW 27 Ave. and NW 79 St., overhead truck ramp, unloading and storage areas which will eliminate the traffic hazards. $15,000,000.

▲ **Fla., Sunny Isles (Miami Beach)**—MOTEL, etc.—E. & E. Holding Corp., c/o MacKay & Gibbs, archts., 927 Arthur Godfrey Rd., Miami Beach, 2 and 4 story motel, 135x337 CB-S & RIC on concrete piling, air-conditioned swimming pool, etc., 18925 Collins Ave. $2,500,000. Obler & Clarke, 927 Arthur Godfrey Rd., Miami Beach, consult. engrs.

▲ **Ill., DesPlaines**—SHOPPING CENTER—Owner, c/o Hertel, Johnson, Eipper & Stopa, archts., 105 W. Adams St., Chicago, 35 store shopping center, Higgins Rd., Oakton and Illinois Toll Rd., near here. $3,000,000.

▲ **Mass., Brighton**—APARTMENT—Owner, c/o Hugh A. Stubbins Assocs,, archts., 806 Massachusetts Ave., Cambridge, 14-16 story apartment, Commonwealth and Chestnut Hill Aves. $2,000,000. 1958 constr.

▲ **Mich., Dearborn** — SHOPPING CENTER — Westborn Center, E. Llwyd Eccleston, pres., Grosse Pointe, plans by Theodore Rogvoy, 2266 Forest St., Detroit, Zone 1, constr. Westborn Center, 20 store shopping center, Michigan Ave. and Outer Dr. $5,000,000.

▲ **Minn., St. Paul**—LIBRARY—St. Thomas College, Rev. J. P. Shannon, pres., 2115 Summit Ave., plans by Lang & Raugland, 802 Wesley Temple Bldg., Minneapolis, 3 story library, $1,000,000. Work to start 1957.

▲ **N. H., Hanover**—HOPKINS CENTER—Bd. Trustees Dartmouth College, Hanover, plans by Harrison & Abramovitz, 630 Fifth Ave., New York, N. Y., Hopkins Center, auditorium and theatre, etc. to stimulate the Arts, $7,000,000. Constr. in Spring 1958. Campbell & Aldrich, 38 Newbury St., Boston, Mass., archts. consultants. CD 6/20.

▲ **N. J., Newark**—COMMUNITY CENTER—Diocese of Newark, Parish of St. Lucy's, 19 Sheffield St., plans by James Virgona, 5 Drury Lane, Palisade, hall and community center, 7th Ave. and Sheffield St. $1,000,000.

▲ **N. Y., Monticello**—SHOPPING CENTER—Montivan Realty Corp., c/o Frank Grad & Son, archts., 11 Commerce St., Newark, N. J., shopping center, Route 17, $3,000,000.

▲ **O., Cincinnati**—HOSPITAL—St. George Hospital, 3156 Glenmore Ave., plans by A. V. Walters, Federal Reserve Bank Bldg., facilities to 150-bed general hospital. $1,500,000. Constr. 1959. CD 8/13.

▲ **O., Cleveland**—HOMES—Dubin Housing Corp., 4236 Lee Rd., Zone 28, 500 homes, E. 174-5 and 176 Sts. $7,500,000.

▲ **O., Shaker Heights**—OFFICE—Allstate Insurance Co., 7447 Skokie Blvd., Skokie, Ill., plans by Garfield, Harris, Robinson & Shafer, 1740 E. 12 St., Cleveland, Zone 14, 1 story, 60,000 sq. ft. brick, stone, regional office bldg., offstreet parking facilities. $1,000,000.

▲ **Pa., Harrisburg** — APARTMENT HOUSES — Capitol Housing Corp., 2 Park Ave., New York, N. Y., plans by John H. Graham, 2430 Pennsylvania Ave. N. W., Wash., D. C., two 18 story apartment houses, Seventh and Boas Sts. $3,000,000.

▲ **Tex., Houston** — CHURCH — Westbury Methodist Church, c/o Floyd — James, archts., 3813 Buffalo Speedway, church. $1,000,000.

▲ **Wash., Spokane**—RETIREMENT HOME—Presbyterian Retirement Homes, c/o A. Arend, W710 Main St., retirement home. $1,000,000.

▲ **Wash., Spokane** — HOME FOR AGED — Riverview Lutheran Home Assn., c/o T. A. Myklebust, Medical Center Bldg., 4 story Home for the Aged. $1,000,000. Work to start in fall.

▲ **Wis., Hartland**—SHOPPING CENTER—Kaiser Bros., 3201 W. Hampton Ave., Milwaukee, 25 store shopping center, $1,000,000.

▲ **Ont., Toronto**—OFFICE—M.E.P.C. Canadian Properties Ltd., 27 Wellesley St. E., plans by Gordon S. Adamsson & Assocs., 52 St. Clair Ave. E., office bldg., University Ave. and Dundas St., $1,400,000, incl. land.

INDUSTRIAL BUILDINGS

▲ **Mo., St. Louis County**—SUBSTATION—Union Electric Co., 315 N. 12th Blvd., St. Louis, Zone 1, bulk substation on 250,000 sq. ft. site in the Lindbergh-Warson Industrial Development Dist., incl. steel structures circuit breakers, transformers, towers and control houses, etc.

▲ **N. M., Albuquerque**—PLANT—Ideal Cement Co., Denver National Bk. Bldg., Denver, Colo., plans by Ken R. White, consult. engr-archt., 1567 Marin St., Denver, Colo., cement plant, $10,000,000-$12,000,000. CD 3/11.

▲ **N. Y., New York**—GARAGE—Gulf Oil Co., Gulf Bldg., Pittsburgh, Pa., plans by Henry C. Brockman, c/o owner, 3 story parking garage East River and 23 St. $1,000,000. Praeger-Kavanagh, 123 E. 38 St., New York, Zone 16, engrs. CD 9/29/55.

▲ **O., Logan**—PLANT—Logan Clay Products Co., Logan, plant for production sewer pipe. $1,000,000.

▲ **Tex., Arlington**—PLANT—United States Chemical Milling Corp., c/o Charles H. Lindquist, pres., c/o Chamber of Commerce, plant, 90-acre site, Texas Industrial Park, State Hy. 157. $1,500,000.

▲ **Wis., Milwaukee** — FACTORY — Evinrude Outboard Marine Corp., 4143 N. 27 St., plans by Eschweiler & Eschweiler, 720 E. Mason St., Milwaukee, 1 and 2 story 125,000 sq. ft. factory addn. $1,000,000.

UNCLASSIFIED

▲ **D. C., Wash.**—BELL TOWER—National Catholic Shrine of the Immaculate Conception, c/o Maginnis & Walsh & Kennedy, archts., 126 Newbury St., Boston, Mass., bell tower, $1,000,000. Constr. 1957.

▲ **Illinois**—PARK—State Conservation Dpt., Springfield, redevelopment of Grand Marais Park in southeastern part of East St. Louis, incl. reclamation of swamp lands for addnl. picnic grounds, provisions for swimming beaches and other recreational facilities, etc., $1,000,000. no appropriation. Funds being sought from Ill. General Assembly.

▲ **Indiana and Michigan**—CRUDE PIPE LINE—Muskegon Pipe Line Co. (Aurora Gasoline Co., 15911 Wyoming St., Detroit, Mich. and Service Pipe Line Co., 199 E 6 St., Tulsa, Okla.), 165 mi. line from Griffith, Ind. to Muskegon, Mich. $3,000,000.

▲ **Oklahoma**—GAS LINE—Colorado Interstate Gas Co., Colorado Springs, Colo., 50 mi. 8 in. natural gas line from Mocane to Hooker together with pump stations, Texas Co. $2,480,000.

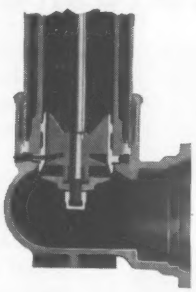
▲ **Pennsylvania and Ohio**—PRODUCTS PIPE LINE—Laurel Pipe Line Co. (Gulf Oil Co., 2900 Gulf Bldg., Pittsburgh, Pa., Sinclair Pipe Line Co., 600 5th Ave., New York and Texas Co., 135 E 42 St., New York), 440 mi. 14 and 24 in. products pipe line from Philadelphia and Pittsburgh, Pa. and Cleveland, O. $50,000,000. Pipe contract awarded to National Tube Div., U. S. Steel Co., 525 William Penn Pl., Pittsburgh 19, Pa.

▲ **Que., Seven Islands**—WHARF—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf development, incl 105x405 ft. freight shed. $3,000,000. Bids soon.

S HYDRANTS...

community protection by design

If you sat down and checked off the features that a well-designed hydrant ought to possess, you would find yourself describing a Mathews Modernized Hydrant



- The main compression-type valve opens *against* water pressure. The higher the pressure, the tighter the valve—a positively leakproof construction.

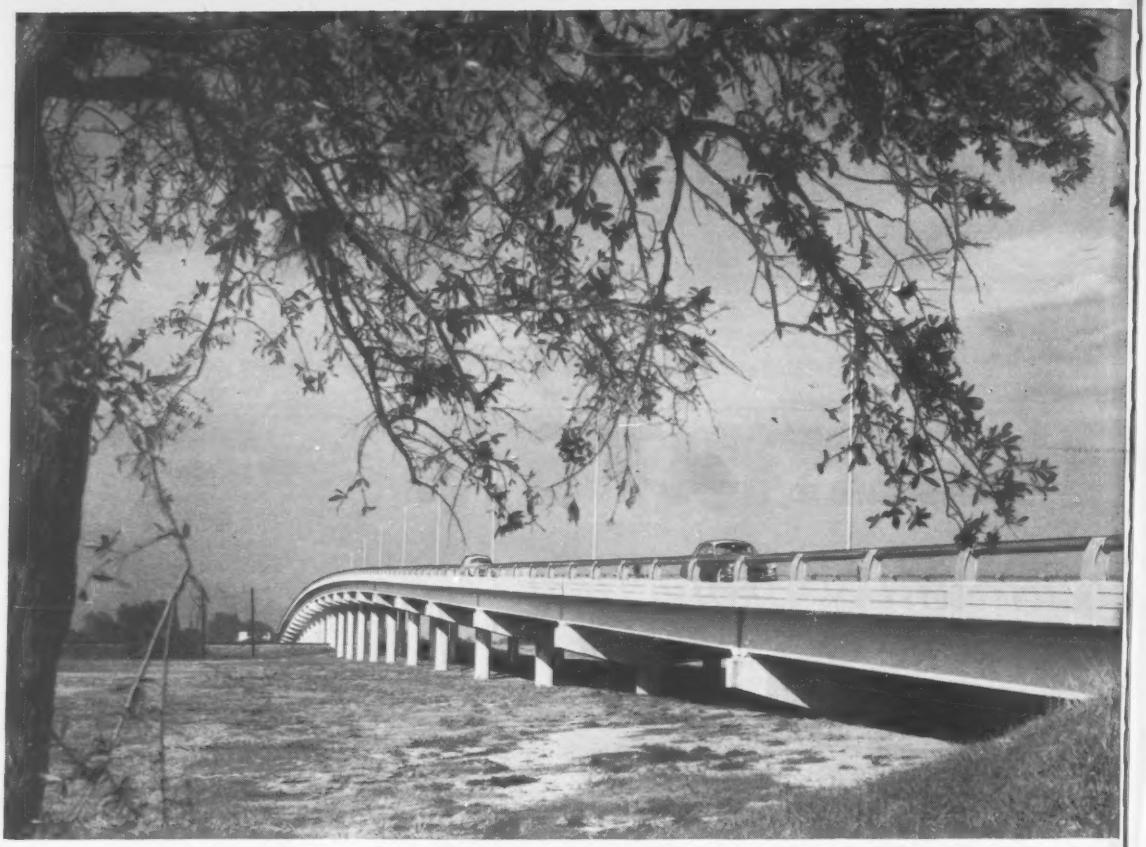
- **OTHER QUALITY FEATURES**

  The operating thread cannot be bent. Head revolves 360°. Nozzle sections can easily be changed. Nozzle level can be raised or lowered without excavation. Bell, mechanical-joint or flange-type pipe connections.

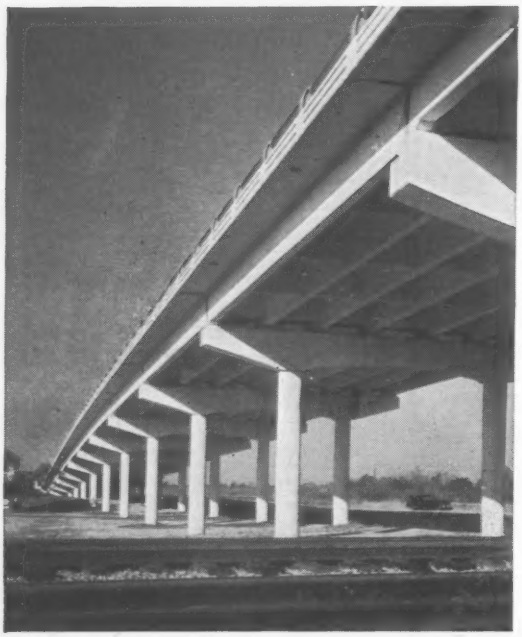
R. D. WOOD COMPANY

Public Ledger Building, Independence Square • Philadelphia 5, Pa.

Manufacturers of Mathews Hydrants and "Sand-Spun" Pipe (centrifugally cast in sand molds)



Build Beautiful Bridges Economically with Precast, Prestressed Concrete



Sweeping gracefully over a railroad, Wisner Boulevard overpass in New Orleans is a beautiful prestressed, precast concrete structure 2450 ft. long. Its 56-ft. spans are designed for H20-S16 loading. Prestressed concrete girders are of T-shaped cross-section and have 5-ft. upper flanges that are joined by a cast-in-place reinforced concrete slab.

The construction features of bridges such as this have special significance today because of the thousands of bridges and overpasses required on the National System of Interstate and Defense Highways.

Whether the bridges you design or build are long or short; straight, curved or skewed; precast, prestressed concrete construction offers many advantages. It is neat and clean. It is economical. It eliminates formwork on the job site. It speeds erection time. Weight and thickness of members are reduced.

For additional information write for free booklets. Distribution is limited to the United States and Canada.

PORTLAND CEMENT ASSOCIATION

Dept. A5e-17, 33 West Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

June 4 Massachusetts

BUILDINGS—BA

▲ **Mass., North Andover**—PLANT—BA 6/4—Western Electric Co., Inc., 195 Broadway, New York, N. Y., (selected list bidders) 1, 2 and 3 story, 450,000 sq. ft. plant exten. $7,000,000. Charles T. Main, Inc., 80 Federal St., Boston, engr.

HEAVY CONSTRUCTION—LB & CA

▲ **VERMONT**—State Dpt. Hys. State House, Montpelier,

W. H. Hinman, North Anson, Me., CA **$3,344,155** hy. and bridge work, combined bids 04 and 05 Proj. IN 001 (4) and IN 001 (5) Guilford and Vernon. Bids May 17. CD 5/21, under LB.

▲† **P. W. Kero, Inc. & Curley Constr. Co., Inc.,** Colling and Central Sts., Rochelle Park, N. J., LB **$3,798,669,** est. $3,601,778, flood control proj., Auburn and Millbury, ENG-19-016-57-80, MASSACHUSETTS. U. S. Eng., 150 Causeway St., Boston, Mass. Bids May 21. CD 4/25.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 4 New Jersey

STREETS AND ROADS

June 4 Maryland — June 4, 6 New Jersey

BUILDINGS—BA

▲ **Del., Wilmington**—SCHOOL—BA 6/11—Alfred I. Dupont School Dist., Concord Pike, Wilmington, Brandywine High School, $3,000,000. Plans deposit $50 for general constr. Extended date. Whiteside, Moeckel & Carbonell, 909 Tatnall St., archts. Louis H. Doane, Penna. R.R. Bldg., engr. CD 3/18.

HEAVY CONSTRUCTION—LB & CA

▲ **General Railway Signal Co.,** 230 Park Ave., New York 17, N. Y., LB **$4,498,750** (2 bidders) furnishing, installing block signaling and interlocking equip. for DeKalb Ave. imprv., BMT Division, Equipment Contr. S-88, BROOKLYN, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids May 17. CD 4/23.

BUILDINGS—LB & CA

▲ **Paul Tishman Co.,** 21 E. 70th St., New York 21, N. Y. CA Est. **$3,000,000,** 11 story SCHOOL of BUSINESS ADMINISTRATION, 100 Trinity Place, NEW YORK, N. Y., New York University, Washington Square S., New York 3, N. Y. CD 8/14/56.

SOUTH

BUILDINGS—SLC

▲ **Fla., Jacksonville**—HOTEL—Office of the Manager, Roosevelt Hotel, 33 W. Adams St., soon lets contract, constr. Hotel Robert Meyer, **$4,000,000.** Wm. B. Tabler, 401-415 Seventh Ave., New York 1, N. Y., archt. CD 5/23/55.

HEAVY CONSTRUCTION—LB & CA

▲ **FLORIDA**—State Road Dpt., Wilbur E. Jones, chn., Tallahasse. Bids opened 5/16,

Fla.—**Cleary Bros. Constr. Co.,** Box 6397, West Palm Beach, Fla., LB **$165,516** (7 bidders), dual 120 ft. bridge and approaches of concrete slab deck on prestressed concrete beams on concrete pile bents over Industrial Canal in Clewiston 0.381 mi., S.P. Job No. 0703-108, SR 25 and 80, Hendry Co.; LB **$294,672** (7 bidders), substructure parts to replace existing treated timber trestle and rest bents over Indian River at Fort Pierce, S.P. Job No. 9405-904, SR A1A, St. Lucie Co.; LB **$1,517,486,** (3 bidders), reconstr. existing 1,055 ft. concrete bridge, incl. concrete slab deck widening on pedestal piers supported by composite conc. piling, replacing existing swing type span with four lane rolling lift electrically operated double-leaf bascule span, concrete sheet pile bulkheads 0.349 mi. light embankment limerock base asph. conc. surf. Royal Park Bridge and approaches over Intracoastal Waterway, in West Palm Beach, S.P. Job No. 9352-150, SR 704, Palm Beach Co.;

Fla.—**Hardway Contr. Co.,** Box 477, Port Tampa, Fla., LB **$6,769,003** (5 bidders), 15,872 ft. bridge on new crossing of Old Tampa Bay, having six 33-ft. spans, two hundred eight-six 48-ft. spans, twenty-eight 66-ft. spans and one 98-ft. span; substructures for 33-ft. and 48-ft. spans are bents of 24-in. concrete piles; substructures for 66-ft. spans are pedestal type piers founded on groups of 24-in. concrete piles; substructure for 98-ft. channel span is piers constr. in cofferdams and founded on steel Hi-piles; decks on prestressed concrete beams having 56-ft. clear roadway divided by 4-ft. wide concrete median strip with conc. safety walks 2-ft. wide on roadway lights 3.006 mi. between St. Petersburg and Tampa, FAI Proj. No. I-104-1(6) Jobs Nos. 1519-201 and 1027-201, SR 400, Pinellas and Hillsborough Counties. CD 4/9.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 5 Michigan — June 11 Ohio

STREETS AND ROADS

June 5 Michigan — June 11 Indiana, Ohio

▲ **ILLINOIS**—BA 6/13—State Toll Hy. Comn., 20 N. Wacker Dr., Chicago,

Contr. T-1-A, grading, drainage, paving, seeding erecting precast and structural steel bridges 3.38 mi. beginning Grand Trunk and Western R.R. extending W. to E. of Ashland Ave. $3,500,000. Sverdrup & Parcel, Inc., 1134 Locust St., St. Louis 1, Mo., section engr.

Contr. T-6-A, grading, drainage, paving, appurtenances erecting precast-structural steel bridges 2.98 mi. W of Midwest Rd., extending E to S. of Roosevelt Rd., $2,500,000. E. Lionel Pavlo, 173 W. Madison St., Chicago 6, section engr.

Contr. T-3-A, grading, drainage, paving, appurtenances erecting precast and structural steel bridges 3.73 mi. beginning S. of 95 St. N. W. to 79 St., $3,500,000, Farkas & Barron, 150 Broadway, New York 38, N. Y., sect. engrs. CD 5/11.

▲ **ILLINOIS**—BA 6/13—Illinois State Toll Hy. Comn., 20 N. Wacker Dr., Chicago,

Cont. T-1-F, grading, drainage, paving, seeding constr. culverts, bridges 5 mi. beginning at Wood Blvd. (US 54) westerly to Chicago, Rock Island and Pacific RR, $3,750,000. Sverdrup & Parcel, Inc., 1134 Locust St., St. Louis 1, Mo., sect. engr. Bids 5/2 rejected. CD 5/23, under LB.

HEAVY CONSTRUCTION—LB & CA

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Springfield, Bids opened May 17,

Ill.—**J. C. O'Connor Sons Co.,** 2104 Miner St., Fort Wayne, Ind., LB **$1,193,524** (3 bidders) wid'n. 5.4 mi. Rte 1, Mt. Carmel north, Wabash and Lawrence Counties; LB **$773,409,** (3 bidders) wid'n. 6.04 mi. S. B 1-Rte 1 in and south of Lawrenceville, Lawrence Co.;

Ill.—**S. J. Groves & Sons Co.,** 1104 W. Reynolds, Springfield, Ill., LB **$6,622,514** (1 bidder) paving 9.03 mi. AASHO Road La Salle to Ottawa, La Salle Co. CD 5/13.

▲ **ILLINOIS**—Illinois State Toll Hy. Comn., 20 N. Wacker Dr., Chicago,

Gust K. Newburg Constr. Co. & Hoyle-Newburg Constr. Co., 2040 N. Ashland St., Chicago, Ill., CA **$14,647,249,** Contr. T-2A, T-2B and T-2C grading, paving, drainage, appurtenances 8.31 mi. extending approx. from northeastern outskirts of Midlothian to 95 St. (Routes 12 and 20) west of Harlem Ave., Bids May 16. CD 4/26.

▲ **ILLINOIS**—Illinois State Toll Hy. Comn., 20 N. Wacker Dr., Chicago, Ill.,

rejected bids May 2, Contr. T-1C, grading, drainage, paving, appurtenances, bridges 5 mi. Wood Blvd. extending westerly to Chicago, Rock Island & Pacific R/W. LB **$8,371,041.** CD 5/7, under LB.

▲ **ILLINOIS**—Illinois State Toll Hy. Comn., 20 N. Wacker Dr., Chicago,

Contracting & Material Co., 1235 Dodge St., Evanston, Ill: and **Kenny Constr. Co.,** 3220 Oakton St., Skokie, Ill. and **Louis Garavaglia,** Centerline Mich., CA **$9,710,990.** Contr. T-9A and T-9-B, combination, grading, drainage, paving, appurtenances, erecting precast conc. and steel bridges 4.39 mi. Touhy Ave., northerly to Golf Rd. Bids May 2. CD 5/7, under LB.

BUILDINGS—LB & CA

▲ **J. F. Pritchard Co.,** 206 N. Liberty St., Kansas City, Mo., CA Total est. **$3,000,000.** expansion to double production facilities at gaseous and liquid oxygen plant, LORAIN, O. Air Reduction Sales Co. 150 E. 42 St., New York 17, N. Y.;

American Messer Corp., 405 Lexington Ave., New York 17, N. Y., CA units to be made by them for plant expansion (Lorain, O.).

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

July 7 Minnesota

STREETS AND ROADS

June 7 Minnesota — June 11 Iowa

BUILDINGS—BA

▲ **Kan., Wichita**—COURT HOUSE—BA 6/4—Sedgwick Co., Court House, Wichita, court house, $6,200,000. Thomas, Harris & Calvin, 321 W. 2 St., archts. CD 4/24, under LB.

▲ **Kan., Wichita**—SCHOOL—BA 6/18—Bd. Educ., Melvin F. McDonald, bus mgr., Administration Bldg., 428 S. Broadway, South High School, 33, 34, S. Osage Sts. and Midland Valley Rd. $3,554,000. Forsbloom & Parks, Beacon Bldg., archts. CD 5/10.

▲ **Mo., Columbia**—DORMITORIES—BA 6/18—Curators University of Missouri, Dale O. Bowling, bus. mgr., 116 Jesse Hall, three 9 story, 58 x 146 ft. dormitories and one story 98 x 120 ft. cafeteria, to connect with dormitories by enclosed passageway at Kentucky and Maryland Aves. $4,500,000. Plans deposit $25. Hellmuth, Obata & Kassabaum, Inc., 315 N. 10th St., St. Louis 1, archt. CD 1/3.

HEAVY CONSTRUCTION—LB & CA

▲† **U. S. Govt.,** c/o Purchasing & Contracting Office, Foster Air Force Base, Victoria, Tex., cancelled bids to have opened May 21, 500 Capehart Family Housing units, Title VIII, ENG-41-656-57-60. Foster Air Force Base, VICTORIA, TEX. Est. **$8,000,000.** Will readvertise. CD 5/7.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 19, 20 California

STREETS AND ROADS

June 6 Nevada — June 19, 20, 27 California

▲† **Arizona**—BA 6/12—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., constr. Painted Rock Reservoir Dam and appurtenances at Gila River Basin, Gila Bend, ENG-04-353-57-41. $10,000,000.

▲† **Calif., Muroc**—TESTS TRACK FACILITIES—BA 6/20—U. S. Eng., 751 S. Figueroa St., Los Angeles, constr. special tests track facilities at Edwards Air Force Base, ENG-04-353-57-75. $3,500,000. CD 8/23.

HEAVY CONSTRUCTION—LB & CA

▲ **Peter Kiewit Sons Co.,** 442 Post St., San Francisco, Calif., CA **$8,499,235.** boring 2 tunnels, 4,400 ft. and 8,800 ft. long as part of relocating Western Pacific R.R. to make way for constr. Oroville Dam on Feather River, Feather River Proj., Oroville Dam, CALIFORNIA. California Dpt. Water Resources, 401 P. Wks. Bldg., 1120 N. St., Sacramento, Calif. Bids May 15, awarded May 17. CD 5/17, under LB.

▲ **CALIFORNIA**—State Dpt. P. Wks., 1120 N. St., Sacramento,

Kenneth H. Golden Co., M. H. Golden Constr. Co. and **E. C. Young and Young & Arrieta,** 3485 Noell St., San Diego, Calif., CA **$3,594,047.** constr. 2.9 mi. 8 lane freeway U.S. 80 in La Mesa and El Cajon, involving grading, paving frontage roads, ramps and interchanges and constr. 4 bridges, 1 pedestrian overcrossing and 3 retaining walls, San Diego Co. Bids May 2, awarded May 17. CD 5/6, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N. St., Sacramento, Bids opened 5/22,

Charles L. Harney, Inc., 575 Berry St., San Francisco, Calif., LB **$7,925,295** (7 bidders) constr. 4.5 mi. Freeway on Sign Rtes. 24 and 21 in Walnut Creek to constitute Walnut Creek Bypass, incl. ramps, frontage roads and connections and 16 rein.-con. bridges, Contra Costa Co. CD 4/12.

▲ **J. Early Jr. Co., Inc. & Peter Kiewit Sons Co.,** 345 Kieways Ave., Arcadia, Calif., LB **$4,020,570** (3 bidders) enlarging Hyperion Treatment Plant, 4 primary clearifiers, new rein.-con. headwork bldg., etc., LOS ANGELES, CALIF. City Council, City Hall, Los Angeles, Calif. Bids May 22. CD 4/2.

BUILDINGS—LB & CA

▲† **C. H. Levell,** 1900 Wyoming Ave., El Paso, Tex., LB **$3,217,000** (10 bidders) constr. TECHNICAL BLDG. ARMY ELECTRONIC PROVING GROUND. Eng-04-353-57-89, FORT HUACHUCA, ARIZ. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 21. CD 4/24.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 5 Ontario — July 10 Alberta

STREETS AND ROADS

June 5 Ontario

HEAVY CONSTRUCTION—LB & CA

▲ **Northern Constr. Co. & J. W. Stewart St.,** 1340 Hornby St., Vancouver, B. C., CA Est. **$25,000,000.** 190 ft. dam on Bridge River and powerhouse on Seton Lake about 120 mi. northeast of here, for Bridge River hydroelectric development in Cariboo District, BRITISH COLUMBIA, British Columbia Electric Co., 425 Carroll St., Vancouver, B. C. CD 11/4/54;

Canadian Westinghouse Co., 355 Burrard St., Vancouver, B. C., CA Est. **$2,000,000.** four 62,000 kw generators for Bridge River hydroelectric development (British Columbia).

BUILDINGS—LB & CA

▲ **Doran Constr. Co. Ltd.,** 5 Concord St., Ottawa, Ont., CA **$4,986,237,** OFFICE BLDG., Elgin, Albert and Slater Sts., National Gallery, OTTAWA, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Mar. 20, awarded May 13. CD 4/10, under LB.

LATIN AMERICA

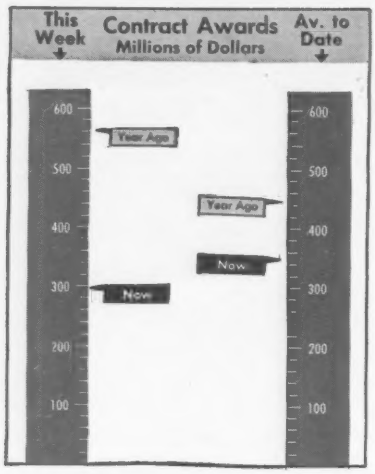
HEAVY CONSTRUCTION—LB & CA

▲ **Grebe & Doremus Process Co.,** 4601 Stanford St., Houston, Tex., CA **$6,000,000.** design and construct REFINERY, near HAVANNA, CUBA Copetrol Oil Refining Co., Havanna, Cuba. CD 5/20.

(Proposal Advertisement see pp. 119 to 122)

Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 22 wks 1957 millions	Chge %
Federal	$26.6	$1,236.5	+60
State and Municipal	171.6	2,965.3	+11
Total Public	198.2	4,201.8	+22
Total Private	100.7	3,682.3	−42
U. S. Total	$298.9	$7,884.1	−19
By Type of Work			
Waterworks	$4.9	$180.2	+43
Sewerage	9.9	189.2	−31
Bridges	9.7	283.2	+19
Highways	85.4	1,228.3	+23
Earthwork, Waterways	14.4	543.7	+85
Buildings:			
Public, Excl. Housg.	43.4	929.0	+10
Public Housing	13.9	303.8	+81
Private Housing	44.0	1,286.1	−51
Commercial	28.9	746.3	−11
Industrial	15.9	1,431.0	−43
Unclassified	28.5	763.3	−7
U. S. Total	$298.9	$7,884.1	−19

NOTE: Minimum size projects included are: Waterworks and waterways, $44 000; other public works, $73.000; industrial buildings, $93,000; other buildings, $344,000.

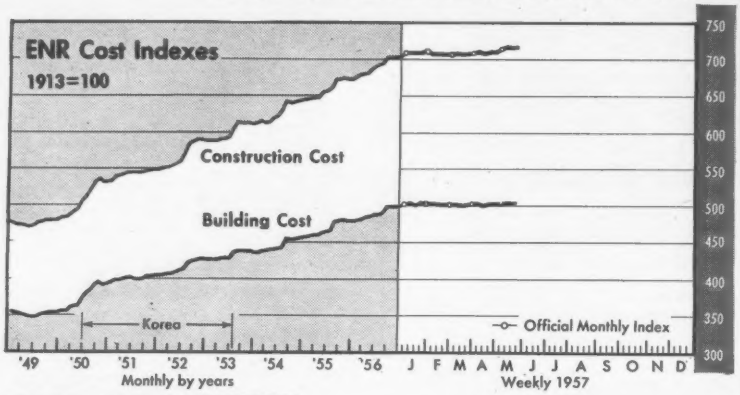
NEW CAPITAL FOR CONSTRUCTION

	Week of May 23	Cum. 21 wks 1957 millions	Chge '56-'57 %
Corporate Securities	$207.7	$2,533.5	+40
State and Municipal:			
All Except Housing	107.4	2,365.5	+30
Housing	...	41.5	+104
Federal Loans	8.3	91.7	+47
Federal Aid	...	250.0	...
Total Nonfederal	$323.4	$5,282.2	+42
Federal Appropriations:			
In U. S.	...	$0.9	−97
Outside U. S.	...	...	...
Total New Capital	$323.4	$5,283.1	+41

Cost Indexes as of Now

ENR INDEXES (1913=100), 20-cities' average	Week of May 23 1957	% Change from April 25 1957	% Change from May 24 1956
Construction Cost	718.56	+1.1	+3.9
Building Cost	503.42	+0.4	+3.0

To convert above indexes to 1926=100: Divide Construction Cost by 2.080; Building Cost by 1.850
1949=100: Divide Construction Cost by 4.770; Building Cost by 3.518



BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	Apr. 30 1957 (millions)	Percent Change from last Month	Year
Total U. S. (ENR reported)	$106,107	−0.1	+ 7.7
By Ownership—			
Private	44,946	+0.4	+ 7.8
State and Municipal	47,732	−0.5	+ 8.7
Federal	13,429	−0.3	+ 3.7
By Type of Work—			
Waterworks	2,265	+0.4	+ 9.8
Sewerage	3,289	−0.1	+ 8.8
Bridges	3,049	−0.5	+ 7.9
Highways	12,891	−2.1	+12.0
Earthwork, Waterways	11,221	−0.2	− 1.3
Public Buildings, including Public Housing	19,338	+0.7	+10.7
Industrial Buildings	16,452	+0.7	+ 6.0
Commercial Buildings, incl. Private Housing	19,137	+0.6	+13.9
Unclassified, Private	9,357*	−0.7	− 0.1
Unclassified, Public	9,108	+1.0	+ 5.8

* Includes private bridges, $88 million

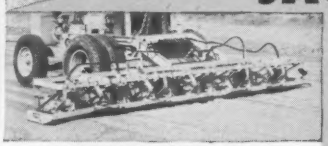
FLOW OF NEW PROJECTS INTO THE BACKLOG

	1957 Apr. (millions)	1957 4-months (millions)	Percent Change from '56 Apr.	Year Cum.
Total U. S. (ENR reported)	$1,324	$7,195	−33.3	−28.1
By Ownership—				
Private	712	3,787	−42.9	−26.3
State and Municipal	517	3,010	−10.4	−29.0
Federal	95	398	−41.1	+40.4
By Type of Work—				
Waterworks	19	127	−32.1	−10.9
Sewerage	28	214	−14.8	+37.4
Bridges	9	178	−50.6	−10.2
Highways	153	1,073	+51.0	+178.4
Earthwork, Waterways	8	66	−20.1	−82.6
Public Buildings, incl. Housing	376	1,486	−23.3	−22.8
Industrial Buildings	298	1,457	−35.4	−38.9
Commercial: Mass Housing	137	980	−71.5	−27.0
Other Building	237	1,054	+ 1.7	+12.7
Unclassified, Private	40	296	−44.3	−37.5
Unclassified, Public	19	264	−67.3	−84.3

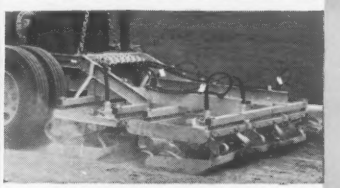
FLOW OF PROJECTS OUT OF BACKLOG INTO CONTRACTS

	1957 Apr.	1957 4-months (millions)	Percent Change from last Apr.	Year Cum.
Total U. S. (ENR reported)	701	3,120	−17.6	− 4.9
By Ownership—				
Private	255	1,206	−48.8	−34.4
State and Municipal	328	1,396	+ 4.7	+25.7
Federal	118	518	+208.6	+55.9

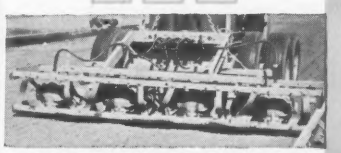
The NEW JACKSON VIBRATORY COMPACTOR



6 UNITS ABREAST FOR MAXIMUM COVERAGE



6 UNITS IN TANDEM FOR MAXIMUM ONE PASS CONSOLIDATION



4 UNITS (or it might be 5) TO EXACTLY FIT JOB WIDTH REQUIREMENTS

5 UNITS IN TANDEM AND STAGGERED. VARIABLE FOR A WIDE RANGE OF WIDTHS.

HAS MUCH MORE POWER and SPEED . . . UNMATCHED ADAPTABILITY TO JOBS OF ALL TYPES!

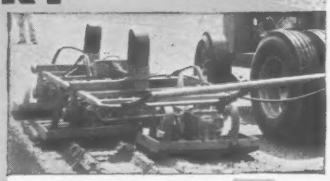
Here's the machine that will give you maximum density of all materials normally used in macadam base courses and sub-bases with the greatest economy and convenience.

It's a vastly improved version of the Jackson Multiple Compactor which was used with great success on virtually all the nation's important paving projects. It is much more powerful and faster, providing time-saving, full course, single pass compaction. And unmatched as it is for quick and easy adaptability to jobs of all types, it will handle each of them with greatest convenience and least lost motion. Moreover, with this machine you can get into places others can't touch. By all means see your nearby Jackson Distributor (name on request) about this machine or write to us for the complete facts before buying any compactor.

ANY ARRANGEMENT DESIRED OF VIBRATORY UNITS IN THE WORKHEAD TO FIT THE JOB MOST ADVANTAGEOUSLY IS QUICKLY AND EASILY ACHIEVED.

JACKSON VIBRATORS, INC.

LUDINGTON, MICHIGAN



4 UNITS TOWED AT SIDE OF TRACTOR. IDEAL FOR ONE PASS WIDENING OPERATIONS.

SHOULDER COMPACTION IS AUTOMATIC. End unit automatically assumes this position — no adjustment required. Prevents raveling.

AND FOR SPOTS OTHERS CAN'T REACH.

Any of the compacting units in the Jackson Vibratory Compactor workhead can be fitted with operating handle and used exactly like the nationally renowned Jackson Manually Guided Compactors. Perfect for getting into odd spaces and close to walls, etc. — spots that can't be reached by other equipment. One man with a twin hookup of two of these units will compact up to 1,200 sq. yds. of granular soils in 6" layers per hour.

Industrial Sites

First national exposition is showcase for cities and states seeking industry

States, cities and private developers seeking new industries for their areas last week took their wares to a central market for the first time as New York City's Coliseum played host to the National Industrial Development Exposition.

Corporation executive and management consultants turned out to see and hear a variety of sales pitches, and to review some of the basic problems facing companies today when they seek a new site for expansion or relocation of an existing plant.

They heard from experts what most had suspected: The larger and more solvent the corporation, the easier it is to get financing for a new plant in the present tight money market.

Almost without exception, large corporations can get the funds they need for their industrial expansion programs, financing experts agreed. But, medium sized firms often must trim down their expansion plans, make substantial increases in their planned equity or pay fairly steep interest rates to get the plant and equipment funds they need. Small companies, or those with one or two recent "poor years," find financing still more difficult—but possible.

While reviewing the variety of financing methods available to firms, Ernest S. Allsop, Vice President of Prudential Insurance Company of America, stressed the increasing importance of lease-back operations, and emphasized the growing importance of life insurance companies in providing the funds needed by industry.

Mr. Allsop said that 16% of all the long-term capital invested in this country comes from life insurance companies, added that the life insurance companies as a group form the largest institutional private lender of long-term funds.

The growing importance of the lease-back method in financing industrial plants also was stressed by another speaker, Clinton B. Snyder, National Chairman of the Society of Industrial Relators, who also described another comparatively new twist.

He told the group, "Today, the demands for investment on the part of individuals through participation in bond issues has created a new type of mortgage broker who procures the loan applications and then goes to brokerage houses and sells them. They, in turn, sell parts of the loan to their people, the same as stock."

This syndicating of loans for industrial development is taking place more and more with smaller companies that have been turned down by other loan sources, according to Mr. Snyder. He added that "With the reluctance or inability on the part of the large loaning institutions to give top loans, the industry seems to be turning more and more to private sources of money."

This also is happening in the lease-back field, Mr. Snyder said. "Builders who are building for industry and leasing, as well as investors, must get the money somewhere to maintain their operations. Therefore, they make the lease and sell the fee to loan sources other than the big financial institutions."

Yields of 8¼ to 12% are being offered on 15 to 25 year leases (with renewal options) by companies with ratings from $500,000 up to $20 million, according to Mr. Snyder.

While these rates are high, they attract the funds needed for the new companies (those with less than 10 years' experience) or those with one or two bad financial years, Mr. Snyder explained.

Aside from the money problems, most of the exhibitors seemed interested in the growing trend toward industrial parks. Not all areas have districts set aside solely for industry with all utilities, transportation facilities and zoning assured, but most feel that this is an inevitable development as the land scarcity becomes more serious for industry.

Norfolk Bridge-Tunnel Costs Up $2 Million

Cost of the Hampton Roads Bridge-Tunnel system will be about $2 million higher than earlier estimates, according to latest report of the Virginia Department of Highways.

The department said that the final cost estimate is now set at $60.5 million, as compared to an original estimate of $54 million. This original figure was raised to $58.5 million after the first contracts were let and some design changes had been made.

However, the Parsons, Brinckerhoff, Hall and Macdonald, New York consulting engineers on the project, said that contingency funds, plus additional earnings from investment of funds, are sufficient to leave a balance of about $1 million for future contingencies, despite the rise in cost.

Rocky Reach Dam

Mid-June bid opening for final stages of work on $200 million project

Financing of the Columbia River Rocky Reach hydroelectric project of the Chelan County, Wash., Public Utility District will proceed with the sale of revenue bonds following the opening of bids June 14 on two contracts for completion of the project, according to Kirby Billingsley, PUD manager.

Bids will be opened for separate general and electircal bids. The general contract is expected to be one of the largest single contracts awarded in the Pacific Northwest, involving a major portion of the work on the $200 million project.

Work under the new contracts is expected to start in the fall; first power production is slated for the fall of 1961.

The project will develop 664,000 kw from an initial installation of seven generators. Space will be provided for four additional generators. The plant will have a head of 95 ft and the dam will form a lake 43 miles long at El. 707, reaching nearly to the base of Chief Joseph Dam.

First stage construction already is well under way under a $12,038,091 contract awarded last September to Rocky Reach Builders, a combine consisting of the Arundel Corp., L. E. Dixon Co., Hunkin-Conkey Construction Co. and American Pipe and Construction Co. Rocky Reach Builders now has the east cofferdam dewatered and is carrying on extensive excavation work and placing footings.

Main generators will be installed by the manufacturer, Westinghouse Electric Corp. The general contractor will install the seven main turbines, 12 spillway gates, intake and draft tube deck gantry cranes, powerhouse cranes and other equipment.

Prefab Home Development Meets Stiff Opposition

Controversy has arisen over the proposed building of a 263 unit low-cost housing development to be located in Plattsburgh, N. Y. The houses will cost about $6,000 and are prefabbed of lightweight concrete walls, topped by a corrugated steel roof.

However, opposition of near-by residents cast some doubt on the project's future.

(*B&F continued on page 106*)

G-800 TRACDRIL

GOES WHERE YOU WANT IT...

And starts drilling! Just one man can move a self-propelled CP Tracdril from hole-to-hole in double-quick time . . . requires no "bull work" . . . tows its own compressor. "Knee-action" tracks compensate for uneven ground. A hydraulically operated U-Arm assures quick positioning for running bench holes or lifters. Hard hitting 4" CP-400 Drill and CP Drill Carriage are combined to afford maximum drilling speed, feed and stability.

Reversible tramming motors enable the Tracdril to whip into reverse, go forward and pivot . . . have "dead man controls" for greater safety.

Chicago Pneumatic

8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS
DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS
VACUUM PUMPS • AVIATION ACCESSORIES

New England City Plans $9 Million Sewage Project

Portland, Me., has received a $9 million plan from its consultants that would clean up mile-square Back Cove, a tidewater cove that has been characterized by the city's health officer as "an open, overgrown septic tank." This body of water, almost completely surrounded by the city, receives sewage from two-thirds of the 80,000 population of Portland through 20 outfalls.

A ring of intercepting sewers would pick up raw sewage before it reaches the cove and carry it to a chlorinating station where it would be pumped through an outfall into the Atlantic Ocean (more accurately Casco Bay).

Existing sludge beds in Back Cove would be dredged to a depth that would assure water coverage at low tide. The dredged material would be used as fill to create 135 acres of new land along the cove, part of which would be right-of-way for the proposed Portland Expressway, a $20 million spur that would be part of the interstate highway system.

The long-range plan was developed for the City Planning Board by Edward C. Jordan Co., Portland, and Fay, Spofford & Thorndike, Boston. Metcalf & Eddy, Boston, have been engaged to make detailed surveys.

(*B&F continued on page 109*)

Construction Markets

Jackson, Miss.: An On-the-Spot Report

"Nothing can stop Jackson."

That, briefly, represents the attitude of city and state leaders as they supplement their vision and determination with money, know-how and hard work in "building a greater Jackson."

"Jackson can't help but grow," they say.

It is Mississippi's largest city, its capital and it enjoys a favorable geographic location in the center of the state and as a natural southern "crossroads."

Oil and industry have worked hand-in-hand in providing for Jackson an economy no longer dependent entirely upon the ups and downs of the surrounding agricultural areas. Therein, lies the story of Jackson's development and its future.

Jackson is becoming less and less dependent upon the financial markets of the East for money with which to ease its "growing pains." The big financial markets certainly are important to the city's development, but local funds are being put to work at home in amounts greater than ever before.

What is the construction market in the Jackson area? The answer: Housing, commercial buildings, industry, highways, public works of all types. Take your pick. The drawing boards of Jackson are loaded.

As for housing, a "tight money" market appears to be easing. Homebuilders expect the dollar volume of home construction to match the total for 1956. The number of starts currently is off considerably from last year, but when and if the money markets relax, low-price housing will likely resume its pace. Industry and President Eisenhower's "soil bank" are bringing more people into Jackson. These will combine to maintain housing demand.

Fortunately for Jackson, there is an abundance of "wide open spaces" into which the city can expand. True, land prices have advanced considerably but the land is available.

Contractors in the commercial building field are expecting volume to hit an all-time high in the months just ahead. Numerous projects of various sizes and descriptions are on the planning boards. Labor and materials are adequate (with the exception of steel) and even steel appears to be finding its way into the Jackson area in greater amounts.

Labor relations in the building trades are good. The present contract in this labor field runs until July 1, 1958.

Architects and engineers have just about as much work as they can handle, considering that there is a shortage of experienced draftsmen.

Jackson, has several major construction projects ahead that will set the pace for the industry.

Foremost, is a $25 million addition to the Mississippi Power & Light Company's Rex Brown Steam Electric Station. Ground has just been broken for this project which will up the plant's capacity from 155,000 to 385,000 kw.

The first contracts are expected to be let within a few months on a long-range airport construction program that will ultimately see the expenditure of $10 million. The short-range estimate is $5 million.

The Mississippi Highway Department has in sight approximately $10 million worth of highway construction in the Jackson area, the major portion of which is in the federal government's new interstate system.

A site has been selected, funds have been appropriated and planning is under way for a $12 million, 500-bed veterans hospital in Jackson near the state's medical school. The latter institution, too, is planning to spend several hundred thousand dollars for new facilities.

A number of state institutions located in the Jackson area have building programs in various stages of planning that will amount to well over $1 million in cost.

R. E. Dumas Milner, Jackson industrialist, has just awarded a contract in excess of $2 million for a 15-story office building to be known as the Petroleum Building.

Meanwhile, the Deposit Guaranty Bank & Trust Co. is pushing toward completion a 16 story addition to its bank-office building to provide the city with more office space.

Mayor Allen C. Thompson estimates that $72 million will be spent by the city on construction in the next four years. The city is currently engaged in a $12 million public works program. Major construction items coming up in the city are: $3 million for a water plant expansion, $1 million for streets, $3,250,000 for schools.

It is expected that a move will be made within the next few months for an expansion of the city limits. This would mean an expenditure of additional millions to bring city services into these new areas.

Engineering surveys are under way to determine the feasibility of a large water reservoir on the Pearl River which borders Jackson on the east, and for a 1,000-acre planned industrial district.

The year 1957 may well be the year in which Jackson moves out from an awkward, sprawling southern city into one of the most progressive metropolitan areas of the South. Everything points toward a "greater Jackson," and a big construction market.

HOW TO PUT A MOUNTAIN THROUGH A PIPE

It's no trick to cut mountains down to size and put them where you want them —when Naylor Spiralweld pipe provides the transportation.

This distinctive steel pipe is light in weight, easy to handle and install. But don't let its light weight fool you. Naylor pipe is built with the exclusive spiral lock that adds strength and safety not found in other pipe of the same wall thickness. The result is performance you'd expect only from heavier-wall pipe.

The same light weight that simplifies handling and installation also pays dividends in lower costs. And you save still more time and money by using the one-piece Naylor Wedgelock coupling for fast, positive connections.

Naylor pipe sizes range from 4 to 30 inches in diameter. Write for Bulletins 507 and 513.

NAYLOR

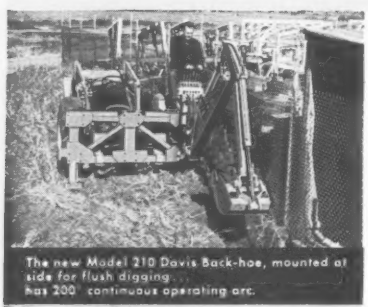
NAYLOR PIPE COMPANY
1248 East 92nd Street, Chicago 19, Illinois

Eastern U.S. and Foreign Sales Office:
60 East 42nd Street, New York 17, N. Y.

DISCOVER DAVIS

THE EQUIPMENT THAT LEADS THE WAY

...AMERICA'S LARGEST SELLING BACK-HOE NOW AVAILABLE TRUCK MOUNTED AT LOW COST!



The new Model 210 Davis Back-hoe, mounted at side for flush digging... has 200° continuous operating arc.

Rugged Davis Loader, the pacesetter in loader quality, design, and performance.

FROM TRANSPORT TO DIGGING IN *1 MINUTE*

The Davis Back-hoe with all its popular profit-making performance characteristics – right-angle operation, rotary seat, vertical stabilizers, visibility, and 7,000 pounds of breakaway... plus the flush digging features with 200° continuous operating arc on the new Model 210 – is now available as a truck-mounted rig. It can be rushed across town, through traffic, or to jobs far out, and then be ready to dig in only one minute.

COMPLETELY DETACHABLE – FREEING TRUCK FOR NORMAL USAGE IN 5 MINUTES

Although rigidly attached to the truck, it has its own self-supporting legs so that it can be detached – freeing the truck for normal hauling jobs. It has an independent hydraulic system powered by any one of several industrial engines. All models of Davis Back-hoes are basic, and are interchangeable on any truck or tractor equipped with Davis attaching brackets.

Davis Products are sold and serviced everywhere in U. S. A. and Canada by better dealers.

FOR NAME OF NEAREST DEALER CALL WESTERN UNION BY NUMBER, AND ASK FOR OPERATOR 25... *or write direct*

MID-WESTERN INDUSTRIES, INC.
1009 SOUTH WEST STREET DEPT. N WICHITA 15, KANSAS

Pike Problem

Kentucky road has best month but receipts still low; free road boosted

Bond holders of the 40 mile Kentucky Turnpike got some warming news in the reports of revenues which showed that the March receipts of $105,075 were the highest in any month since the tollroad started operation last August.

But they got chilling news from Governor Chandler, an avowed opponent of the pike, in his announcement that he would do everything possible to advise motorists that a free route, U. S. 31, parallels the turnpike for the full distance between Louisville and Elizabethtown.

The revenue for the pike for the month of March was $16,262 more than February and $1,637 higher than the previous monthly high of last September. Of the March total, $93,879, came from tolls, the rest from rentals on concessions, and advance ticket sales. However, bond holders have pointed out that monthly earnings never had reached the amount necessary to pay interest on the $38.5 million of outstanding bonds—a figure which would have to reach $109,083 a month. Bond holders have protested against inadequate directional markings.

Governor Chandler's comment on marking the free road came after he had agreed to an open hearing on the bond holders' complaint to be held May 20 at Frankfort. In a letter sent to T. Henry Boyd, vice president of the bonding firm for the turnpike, Governor Chandler repeated an often-expressed criticism that the tollroad begins nowhere and ends nowhere. "I still believe this," the governor said, "just as I believe it was unwise to build a turnpike parallel to one of the few four-lane roads in the state. These objections will not, however, keep me from doing my best to meet the obligation incurred by the turnpike."

Richmond-Petersburg Pike To Finish Within Budget

Despite costs higher than estimates in several categories, the chances are good that Virginia's Richmond-Petersburg Turnpike Authority will be able to complete its road within the $69 million fund allotment.

With most major contracts awarded, the cost of construction now is estimated at $47.4 million, about $3.2 million above estimates made in 1955. Right-of-way and demolition costs, for example, have gone up nearly $2 million over original estimates.

However, Mr. Pershing reports that the increase in cost has been offset in part by a $270,000 saving in financing costs, an estimated $500,000 increase in interest earned from construction fund investment, and $707,000 in accrued interest deposited to the construction fund account. He adds that the sixth progress report of the consulting engineers—Parsons, Brinckerhoff, Hall & Macdonald of New York shows $457,500 remaining for contingencies. Certain items of expenditures, including toll equipment, utility work, headquarters building and fencing remain to be made.

The target date for opening the turnpike remains April 1, 1958.

See $50 Million Jump In Cincinnati Expressways

Further evidence of the rise in total cost of some of the new highways being planned under the federal road program came to light in Cincinnati last week. Officials reported that the city's expressway plan will now cost $50 million more than had been originally figured.

Officials cited two reasons for the jump from $200 million estimated in 1956 to the new estimate of $250 million.

The addition of Cincinnati approaches to a new bridge to Newport will cost $15 million more than expected; rigid government standards particularly as regards to shoulder widths, and the installation of guard rails, posts or other barriers in center strips in city areas, increase expressway costs within the city by about $35 million.

Pennsylvania Road Bureau Sets Up Contract Unit

In another move to speed construction plans prepared by contract engineering firms under the federal highway program, the Pennsylvania Highway Department has established a new office.

The new unit will coordinate contract engineering plans formerly handled by district engineers. Primary function is to guarantee that all construction plans developed by contract are prepared in accordance with department standards and specifications. Decisions previously referred to headquarters at Harrisburg will be determined at district conferences or at one of the three coordinating offices.

(*B&F continued on page 110*)

Design Approved for $46 Million Building

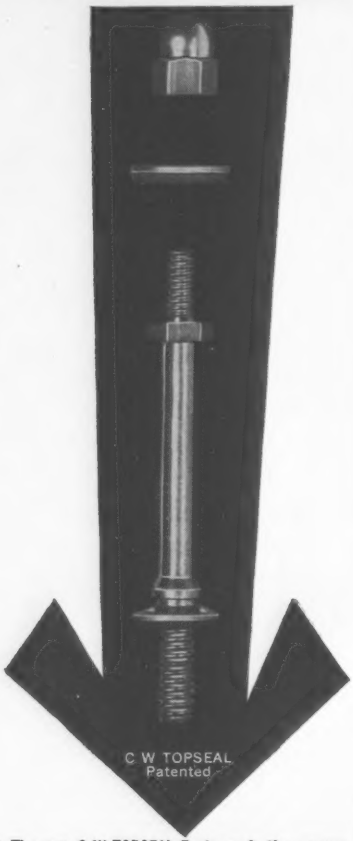
The General Services Administration and the Central Intelligence Agency of the U. S. government have approved the architectural design of a new $46 million CIA headquarters building in Langley, Va. The 8 story structure will occupy a 120 acre site across the Potomac from Washington.

The two year construction job is expected to begin this year.

The building will contain slightly more than a million sq ft of net assignable floor area. It will be air conditioned.

The rendering depicted above, prepared by Harrison & Abramovitz, of New York, architects of the project, is included in a GSA exhibition called "One Hundred Years of Federal Architecture," now on display in the Washington headquarters of the American Institute of Architects.

CURTAIN WALL
TOPSEAL Fastener



The new C W TOPSEAL Fastener is the answer to LOW COST Erection of field assembled Curtain Walls.

●

Developed for the specific application of installing field assembled Curtain Wall panels — the C W TOPSEAL is an added refinement to the superior

TOPSEAL System of Structural Fastening
for
New Construction
Additions
Insulating Existing Roofing and Siding

●

Whether the paneling is aluminum, galvanized, or stainless steel —

Whatever the thickness of the insulating material —

There is a C W TOPSEAL for the purpose — time-tested and proven outstanding quality.

●

Cost comparisons put C W TOPSEAL Fasteners far in the lead — Lowest Installed Cost per Square.

Samples and Data on Request

FABRICATED PRODUCTS CO.

West Newton 2, Pa.

Road Costs Drop

Terrain, competition get credit for Idaho savings

A large number of bidders plus favorable job conditions combined to chop Idaho's roadbuilding costs in the first three months of this year.

Idaho's highway construction cost index dropped 27.9% below the fourth quarter of 1956. Its current value is 95.9% of the 1950 average, making the present reading the lowest in more than two years.

Colorado and Texas also reported lower roadbuilding costs for the first quarter of this year.

Idaho's unclassified excavation costs stumbled 41% for the quarter. A major reason for this is the fact that the terrain permitted the use of high production machinery. Rolling costs were low because much of the cost was absorbed in the grading operation.

Homebuilders Must Post Development Bonds

The Duval County, Florida Commission, has ordered that all subdivision developers must post a bond for one year in the estimated amount of the cost of construction for roads, drainage and other facilities.

Before a plat is accepted, complete plans for the subdivision must be filed with the County Engineer who will estimate the construction cost of essential facilities. During the year the bond is in force, the developer will have to maintain the streets.

Business Briefs . . .

• **Supplier's sales up**—Building materials sales for the Johns-Manville Corp. for the first four months of this year outpaced the same period in 1956 because of a large volume of work in the repair, remodeling and additions field, according to Harold R. Berlin, vice president and general manager of the Building Products Division.

• **Profitable four months**—Sales of Caterpillar Tractor Co. for the first four months of this year were up a resounding 10% over the same period in 1956. The total for January through April was nearly $246.7 million. After-tax profits for the same four months totaled $18.6 million, also up 10% over the comparable 1956 period.

• **Utility purchase**—Springfield, Mo., voters approved a $22 million bond issue to enable the city to purchase the waterworks plant and distribution facilities of the privately owned Springfield City Water Co. The 40 year revenue bonds will be retired from the system's earnings.

$32 Million Shopping Center Planned

Construction will start soon on a $32 million regional shopping center on the north side of Atlanta, Ga., that is expected to be the largest such center ever built south of New York City.

The project is being built by Rich's Department Store, of Atlanta; Lenox Square, Inc.; and the Samuel Roberts Noble Foundation, of Ardmore, Okla.

Rich's, which does an annual volume of business of $80 million, will occupy a three story, 200,000 sq ft area in the largest of 70 stores in the center.

The Noble Foundation, principal owner of the center, which will be known as Lenox Square Inc., was established in 1945 by the late Lloyd Noble, oil man and drilling contractor.

5 Peerless Pump Designs

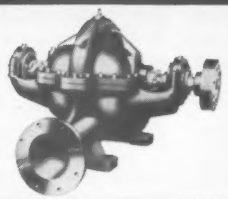
that squarely meet every LIQUID HANDLING REQUIREMENT

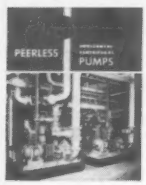
PEERLESS PUMP

THESE ARE THE *Pumps*	ASK FOR *FREE* ENGINEERING BULLETINS

TYPE A AND TYPE AS GENERAL PURPOSE PUMPS

Use these pumps in the widest range of water handling services. Single stage, horizontal split case design. Mechanical shaft seal construction available in sizes up to 4" (Type AS). Heads: up to 300 ft.; capacities up to 70,000 gpm.

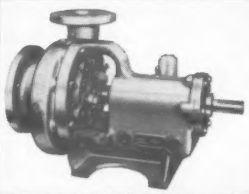




Ask FOR BULLETIN **B-1300 & B-1350**

TYPE DL AND DM CHEMICAL PROCESS PUMPS

Combine quality with economy through a practical idea of component interchangeability between pump types. Oil and grease lubricated bearing housings. Packing gland or shaft seal designs. Air or water cooled back plates. Heads to 430 feet; capacities to 800 gpm. Pressures to 400 psig.



Ask FOR BULLETIN **B-1608**

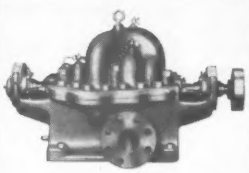
TYPE PE AND TYPE PB END-SUCTION PUMPS

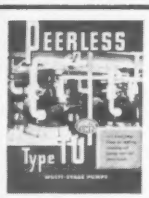
America's broadest line of economical, general purpose pumps. Horsepower range from ¼ to 150. Head range to 260 ft. Capacities up to 5500 gpm. Easy to buy, apply, install and maintain. Tens of thousands in use.

Ask FOR BULLETIN **B-2300**

TYPE TU AND TYPE TUT MULTI-STAGE PUMPS

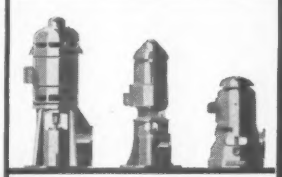
2,3,4 and 5-stage designs for supplying, circulating and boosting water and other liquids in moderate capacities against medium and high heads. Durable and dependable in operation. Heads up to 1660 feet; capacities up to 3000 gpm.

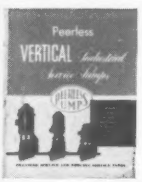




Ask FOR BULLETIN **B-1400**

VERTICAL INDUSTRIAL SERVICE PUMPS Heavy duty, extra heavy duty and process service types for application to cooling tower service, tank pumping, etc. One of the proudest lines manufactured. Save on piping, always primed, require minimum floor space. Heads to 1000 feet; capacities: 30 to 40,000 gpm. HP range: up to 2500 h.p.





Ask FOR BULLETIN **B-505**

MAIL COUPON FOR ILLUSTRATED BULLETINS

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORP
Factories: **Los Angeles, Calif., and Indianapolis, Ind.**
Offices: **New York; Atlanta; Chicago; St. Louis; San Francisco; Phoenix; Fresno; Los Angeles; Plainview and Lubbock, Texas; Albuquerque, New Mexico.**
Distributors in Principal Cities; Consult your Telephone Directory

PEERLESS PUMP
fmc FOOD MACHINERY AND CHEMICAL CORPORATION ®

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
301 W. Ave. 26, Los Angeles 31, California
Please send Bulletins checked below

- ☐ Type A Bulletin B-1300
- ☐ Type AS Bulletin B-1350
- ☐ Type DL-DM Bulletin B-1608
- ☐ Type PE-PB Bulletin B-2300
- ☐ Type TU Bulletin B-1400
- ☐ Vertical Types Bulletin B-505

NAME_____

ADDRESS_____

CITY_____ STATE_____

ENR

Teamsters Win a Reprieve

AFL-CIO removes Dave Beck from office but leaves door open for the union to remain in the federation

The top command of the AFL-CIO last week substantially increased the odds against expulsion of the teamsters union from the federation. A veteran teamster official—John F. English—was named to the AFL-CIO executive posts left vacant by the removal of teamster President Dave Beck, and the federation hearing on charges of corruption in the teamsters union was indefinitely postponed.

Both actions were generally interpreted as a tacit expression of a conviction that the teamsters themselves—if given a chance—will choose to mend their ways and remain within the federation.

The road to the principal objective—Mr. Beck's demise as teamster chief—was quickly paved. On Saturday, Mr. Beck, announced he would not seek reelection as union president in September. Reason he gave, however, was his wife's health, not his current censure as a union officer.

The Executive Council's election of Mr. English as an AFL-CIO vice president and Executive Council member followed by one day the removal of Mr. Beck for violating "basic trade union law" by "gross misuse of union funds entrusted to his care." Mr. English, a Boston native and teamster member since 1904, has been an international vice president, general organizer and auditor, and secretary-treasurer.

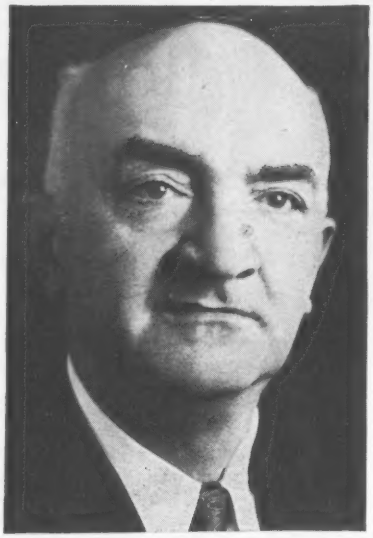
Mr. Beck's ouster as an AFL-CIO officer legally does not affect his status as general president of the teamsters union and eighth vice president and Executive Council member of the AFL-CIO Building and Construction Trades Department. Under the principle of autonomy, these posts are beyond the reach and control of the AFL-CIO.

There was no indication last week of any formal steps to change Mr. Beck's status as a departmental building trades official, but the election of Mr. English quickly bolstered an effort within the teamsters union to force Mr. Beck's resignation or removal as union president.

Mr. English, who has quietly cooperated with the Senate Select Committee investigating labor, and possibly management, activities to the committee's satisfaction, immediately took the helm for the anti-Beck forces. He said: "We are going to wash our own dirty linen, American labor is going to be proud of us again."

Combination of last week's events quickly promised a bitter intramural fight in the teamster house cleaning. For the union presidency, Mr. English is supporting John T. O'Brien, fourth vice president of the union. Mr. Beck is plugging without success for Einar Mohn, also a vice president. And James Hoffa, who was generally considered until recently to be Mr. Beck's heir apparent, has put his hat in the ring.

Meanwhile, the AFL-CIO Ethical Practices Committee, which has been assigned the task of investigating the teamsters union with expulsion as the possible outcome, has temporarily halted its hearings. The action was taken ostensibly to update the committee's charges of teamster corruption based on testimony presented before the Senate Select Committee since May 6. But, as a practical matter, it gives the teamsters a breathing spell in which to pull themselves out of their present hole by taking corrective action on their own initiative.



JOHN F. ENGLISH gets a chance to restore confidence in the teamsters union.

Long-Term Labor Pacts Continue

Many three-year contracts concluded; others stress early negotiation, pre-job conferences, apprentices

A new three-year contract that will give 18,000 operating engineers in 46 northern California counties an immediate wage boost averaging 22½ cents an hour was reached last week, subject to union ratification, with the Northern and Central California Chapters of Associated General Contractors.

The contract is one of many recently concluded with AFL-CIO building trades across the nation. For the most part, they reflect an increasing interest in efforts to stabilize labor costs and relations. Immediate and deferred hourly wage increases in the neighborhood of 15 cents still are common, and several unique provisions have appeared.

The California agreement, which has a reopening clause on wages, hours, supplementary unemployment benefits and vacation pay effective April 1959, will give members of Operating Engineers Local 3 another hourly wage increase averaging 20 cents next May. New wage scales will range from $2.80 to $3.75 this year and from $3.00 to $3.95 next year. Tunnel workers, who will get a 12½ cent hourly differential, will be paid on a portal-to-portal basis.

Included in the contract is provision for a new pension fund calling for a 5 cent hourly employer contribution starting January 1 and changing to 10 cents a year later. The union, however, failed in its efforts to obtain a vacation fund, to put foremen on a salary basis and to win increased subsistence pay.

• **Something different**—The pact provides that when operating engineers are working with a specialty craft they will get the same wages and working conditions as that craft, except for welfare, pension and vacation payments. The provision does not apply if the engineers work with the craft less than 75% of the time.

A unique provision on a broader scale turned up in Baltimore, which now has behind it the longest and most costly building trades strike in its

history. The new three-year pacts provide that negotiations for new contracts shall begin a full year before expiration of the agreements. Only trades still to settle are the carpenters and one group of teamsters.

In Chicago, a shortage of plumbing apprentices is being used as an unusual lever in wage talks with the Plumbing Contractors Association. Present estimates put the number of apprentice plumbers at 500 and the number of journeymen at 6,000. The contractors want more and, in reply to union demands for a mid-contract wage boost have said: "Unless agreement is reached on a new apprentice contract, no wage increase will be granted during the term of the present labor agreement."

And in Toledo, Ohio, a pre-job conference provision appears as a new feature in the master contract between the Toledo Building and Construction Trades Council and the General Contractors Association. To minimize the possibility of labor difficulties after projects get under way, the contract calls for a pre-job conference of contractor and unions before construction starts. Only trades left to settle are the carpenters, sheet metal workers and roofers—the rest lined up on new one-year, 22½-cent package agreements.

• **Other settlements**—In the latest crop of labor contracts are a number of three-year agreements with predetermined deferred wage boosts. Rhode Island carpenters have settled with the Road Builders Association—but not the Associated General Contractors—on 20 cents for each of three years, plus whatever fringe benefits they win from the AGC. Iron workers and bricklayers in Minneapolis, Minn., will get 15 cents each year and roofers will receive a total of 60 cents payable in four installments of 15 cents each.

Net result of wage talks now concluded with the seven Des Moines, Iowa, trades that were negotiating this year is a hodge-podge of one and two-year contracts. Most of the wage boosts fall in the 12½ cent bracket. Plumbers made out the best of all—a two-year contract for increases of 17½ and 12½ cents; payments to the pension, vacation and apprentice training funds are continued.

In Akron, Ohio, the plumbers (Local 219), who had earlier refused to go along with the Construction Industry Advisory Council recommendations accepted by 11 other trades, pulled out of the council and took a one-year contract that grants a 24 cent wage boost.

Color in Safety Promotion

Members of building trades unions participate in safety experiment on Turner Construction Co. job

Use of color as an accident deterrent in the construction industry is being promoted by the building trades unions in Syracuse, N. Y.

John Connell, president of the Building Trades Council has obtained membership approval for active participation in a pilot study which involves the wearing by construction workers of brightly-colored shirts. In colors scientifically chosen to conform to the Safety Color Code approved by the National Safety Council and adopted by the American Standards Association, the shirts are being worn on the new $12 million Administration and Research Center under construction for Carrier Corporation by Turner Construction Company.

The experiment is based on the premise that vision—the ability or inability to see—is a significant factor in a great majority of industrial accidents, making both brightness and color conducive to safety consciousness. Visual reaction to color is considered involuntary and immediate.

The Syracuse study uses the new Construction Color Code designed by Faber Birren. It emphasizes colors such as orange, yellow, green and blue, which are designed to attract the attention of workers and to induce specific pre-determined associations. Accordingly, the code attempts to meet the needs of specific crafts. Workers, for example, exposed to a high degree of hazard—structural steel workers and elevator operators—are wearing shirts of orange, the same color used to mark parts of machines or equipment that might cut, crush or otherwise injure a worker. Those in semi-hazardous jobs, such as air-conditioning and electrical work, are wearing green, while white has been reserved for men in moderately-hazardous jobs—plastering, lathing, glazing, painting and interior carpentry. Colors for the shirts were coordinated by the Vat Dye Institute, which assists industries in setting up safety color codes.

Color has been used successfully in safety promotion by the army and navy and in such industries as aircraft manufacturing, oil drilling, transportation and agriculture. But its use in the construction industry, which has one of the nation's highest accident frequency rates, has been relatively limited. The chances of a worker being injured in construction work are generally considered to be three times greater than they are for workers in manufacturing industries.

Overtime Order Changed On School Construction

Contractors engaged in federally-assisted school construction under the School Survey and Construction Act of 1950 are no longer required to comply with the Eight-Hour Law.

The new order was issued this month by the Community Facilities Administration of the Housing and Home Finance Agency, which handles contracts under the law that provides assistance to school districts crowded by federal activity.

Previous application of the law by the Housing and Home Finance Agency had been questioned by the House Education and Labor Committee. Committee Chairman Graham Barden said the eight-hour work day requirement does not apply under the school law and that it should not have been added by an administrative agency.

The Eight-Hour Law requires overtime pay at time and one half for work in excess of eight hours in any one day.

Union Funds Benefit Puerto Rican Housing

Another $2,600,000 of union funds flowed into the housing market this month when the International Ladies Garment Workers Union agreed to purchase government-insured mortgages on new homes in Puerto Rico.

The money will be used to finance the purchase of 400 homes to be built by Ibec Housing Corporation under the auspices of the International Basic Economy Corporation, a Rockefeller enterprise. Over half the homes will be reserved for purchase by members of the union.

Earlier this month, the ILGWU and the International Brotherhood of Electrical Workers allocated a total of $30 million for the purchase of FHA mortgages on housing units for Air Force personnel.

(*Labor continued on page 114*)

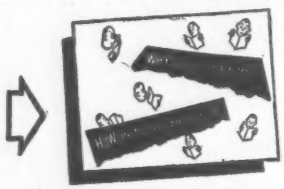
All business is specialized

. . . and nothing specializes on your business like your business paper

This smart business man spends his time where every sitzmark parks a prospect at his feet. He *specializes.* Your business is specialized, too . . . and so is your business paper. It's concentrated on *your* business. Both editorial and ad pages report what's new that's good . . . suggest new methods . . . gather in one place a raft of ideas on where-to-buy-what.

That's help you can't find concentrated into such quick reading time anywhere else! It's simple sense to read every page . . . every issue.

This business paper in your hand has a plus for you, because it's a member of the Associated Business Publications. It's a *paid* circulation paper that must *earn* its readership by its quality . . . And it's one of a leadership group of business papers that work together to add new values, new usefulness, new ways to make the time you give to your business paper still more profitable time.



A copy of this quick-reading, 8-page booklet is yours for the asking. It contains many facts on the benefits derived from your business paper and tips on how to read more profitably. Write for the "WHY and HOW booklet." Room 2710.

McGRAW-HILL PUBLISHING COMPANY
330 W. 42nd St., New York 36, N. Y.

One of a series of ads prepared by
THE ASSOCIATED BUSINESS PUBLICATIONS

Operating Engineers Suspended in Canada

The International Union of Operating Engineers in Canada has been suspended from the Canadian Labor Congress because of jurisdictional violations.

The action was taken by the CLC's Executive Council following an investigation of charges contained in 24 complaints filed by 11 unions. Like our own AFL-CIO, the CLC was formed last year by the merger of the Canadian Congress of Labor and the Trades and Labor Congress. Membership of the engineers is estimated at 10,000.

Suspension of the union was based on the union's violation of the federation's constitutional provision that "each affiliate shall respect the bargaining relationship of every other affiliate, and no affiliate shall raid the established collective bargaining relationship of any other affiliate."

The suspension, which may be appealed by the union, will go before the CLC convention next year, unless the engineers meanwhile demonstrate compliance with union law. Ultimate disposition could be expulsion.

The Canadian constitutional provision against raiding closely follows the one in the AFL-CIO constitution. And the Canadian group also has a non-raiding pact similar to the U. S. one.

Plumbers Adopt New Codes For Joint Industry Funds

The United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry has served notice to its affiliates that the union's new standards for administering Joint Industry Funds will be vigorously enforced.

Approved by the UA's General Executive Board, the standards—10 in number—are intended to serve as guideposts to UA locals. Their purpose is to assure that promotion funds established by contractors and UA locals to improve and expand the industry will not be misused.

The funds are financed by contractor payments based on payroll and, from the workers' point of view, are intended to provide more opportunities for profitable employment. UA President Peter T. Schoemann, in the current issue of the union's monthly magazine, says that UA journeymen "at best only derive indirect benefits of a very general nature from these funds." This, he points out, underscores the necessity that the funds be conceived soundly and administered properly.

To that end, the standards require that each fund in which a UA local participates be established under a separate trust agreement that details the purposes of the fund; these can relate to "trade promotion aims and objectives only." The funds cannot be intermingled with other funds or be diverted to general union or employer use and must be jointly administered by local unions and employers, who must serve without compensation. Independent audits are required at least twice a year and the audits must be made available to both union members and employers. Independent (non-association) contractors must be given representation on Joint Industry Boards. Contractors having national agreements with the UA will not be required to contribute to the funds, but will be required to contribute to the National Apprenticeship Fund and to local health and welfare, pension, vacation, and holiday funds where they exist.

Union locals that fail to conform to the standards, Mr. Schoemann warns, will be subject to disciplinary action.

Two Attacks Are Launched Against Prevailing Wages

Several aspects of the principle of prevailing wages were severely criticized in two midwestern states last week.

In Iowa, the Associated General Contractors of Iowa launched an attack on an ordinance recently passed in Des Moines. The ordinance requires contractors working on city jobs costing more than $500 to pay what the U. S. Labor Department determines to be the prevailing wage in the Des Moines area.

Contention of the AGC is that the validity of the ordinance is questionable and exposes contractors to the risk of not getting paid for work that is subject to the prevailing wage requirement. Gist of the argument is that application of the ordinance will increase the cost of city work; the state law prohibits a city council from taking action that increases the cost of special assessment work; contractors can't be compensated for costs incurred under an ordinance that's void.

The AGC attack provoked conflicting comment. The mayor said: "I don't know that the ordinance is going to make the jobs cost more." Two councilmen supported the measure's validity, one saying he doesn't think "the ordinance is going to make any difference on pay rates." Another backed the AGC position.

And in the Missouri Senate, a proposal that prevailing wages be paid on state and local public construction jobs was withdrawn after it became bogged

General Contractor: *Moore Construction Co., Austin*
Sheet Metal Contractor: *H. E. Little & Co., Austin*
Chase Copper Wholesaler: *Calcasieu Lumber Co., Austin*

It took 54 TONS of Chase® copper to re-roof the Texas State Capitol

Almost 61 years from the day it was completed, this magnificent capitol building at Austin, Texas, got a brand new roof. Chase copper — 108,000 pounds of it, mostly 16 oz. cold rolled sheet — was chosen for the job, because Chase copper roofing is known for its quality, workability, beauty and permanence.

There's a "tall Texas tale" we can tell you, too. During those 61 years, the story goes, the original metal roof (not copper) began to deteriorate, and was *turned over* in its entirety to expose a fresh surface to the elements. That need never be done again, though. When Chase copper roofing goes on, it goes on *to stay*.

Only the best for Texas — and for *you*, too! Insist on Chase copper when planning your next roofing job... big or small.

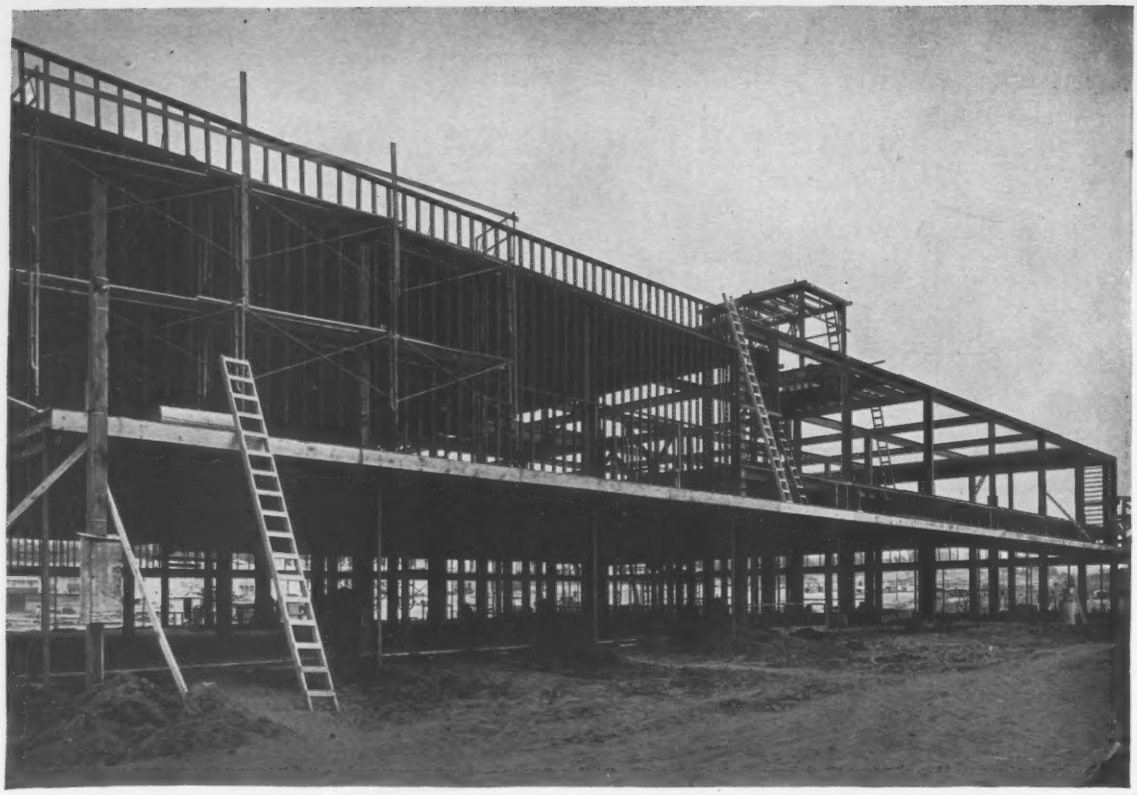
Chase

BRASS & COPPER CO.

WATERBURY 20, CONNECTICUT
SUBSIDIARY OF KENNECOTT COPPER CORPORATION

The Nation's Headquarters for Brass, Copper and Stainless Steel

Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York (Maspeth, L. I.) Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury



LIGHTSTEEL cuts the cost of curtain walls in new J. C. Penney Co. department store

The handsome J. C. Penney Co. department store at Westlake Shopping Center, Daly City, California, is a two-story and basement structure with a welded-steel rigid frame. Penmetal LIGHTSTEEL was specified for exterior curtain walls, parapet walls, penthouse and elevator machine-room enclosures because of its recognized cost-cutting potential.

The light weight of the Penmetal studs cut dead-weight loads, helping the architect save on foundation size and cost. They provided the necessary rigidity but reduced the quantity of structural steel required. And, they were easily, speedily placed.

Important economies were effected by using the LIGHTSTEEL nailing groove for the attachment of lath to both sides of the studs, and by installing wiring and piping through the carefully engineered openings in the sections. The LIGHTSTEEL was cut to size at the job site and spot welded to the framing, eliminating costly shop work.

Send for data on versatile LIGHTSTEEL. Ask for catalog SS-14 and technical manual SS-8.

The new J. C. Penney Co. department store in Daly City, California was designed by Lloyd Gartner, A.I.A, and Associates of San Francisco.

Owner and contractor: Henry Doelger Builder, Inc.

PENN METAL COMPANY, INC.

General Sales Office: **40 Central Street, Boston 9, Mass.**

Plant: **Parkersburg, W. Va.**

District Sales Offices: **Boston, New York, Philadelphia, Pittsburgh, Chicago, Detroit, St. Louis, Dallas, Little Rock, Seattle, San Francisco, Los Angeles, Parkersburg**

Representatives in Principal Cities

Penmetal 1869

PM-139

down with amendments and criticism.

One amendment would have limited its application to state financed projects. Another proposal would have eliminated the provision that wage determinations be based, in the absence of collective bargaining agreements, on those in use on federal projects within the state. One senator had asserted the bill would increase the cost of state projects, including maintenance.

ESA Lauds Overtime Curb On Defense Contracts

Engineers and Scientists of America has expressed "complete agreement" with the Defense Department's recent curtailment of overtime on defense contracts, insofar as the action relates to professional engineers and scientists.

ESA is a national federation of collective bargaining units established for employed professional engineers and scientists.

In supporting the curb on overtime, ESA President Joseph Amann asserted that the work output of professional people does not proportionately increase with the number of hours worked. After a short stint of overtime, he said, "efficiency lags to the point that the engineer only produces about as much in 50 hours per week as he formerly did in 40". In addition, he noted, the overtime curb may eliminate some current overtime abuses, such as use of overtime for salary adjustments, for maintaining intra-company personnel priority and for reducing economic discontent among employees.

Results Mr. Amann said he expected to flow from the Defene Department action are greater efficiency, lower costs to taxpayers and better utilization of engineers.

Unionist Claims Refugees Given Substandard Wages

Ralph Hockman, business agent of bricklayers Local 55 in Columbus, Ohio, has charged that Hungarian refugees are being paid sub-standard wages by nonunion contractors in Central Ohio.

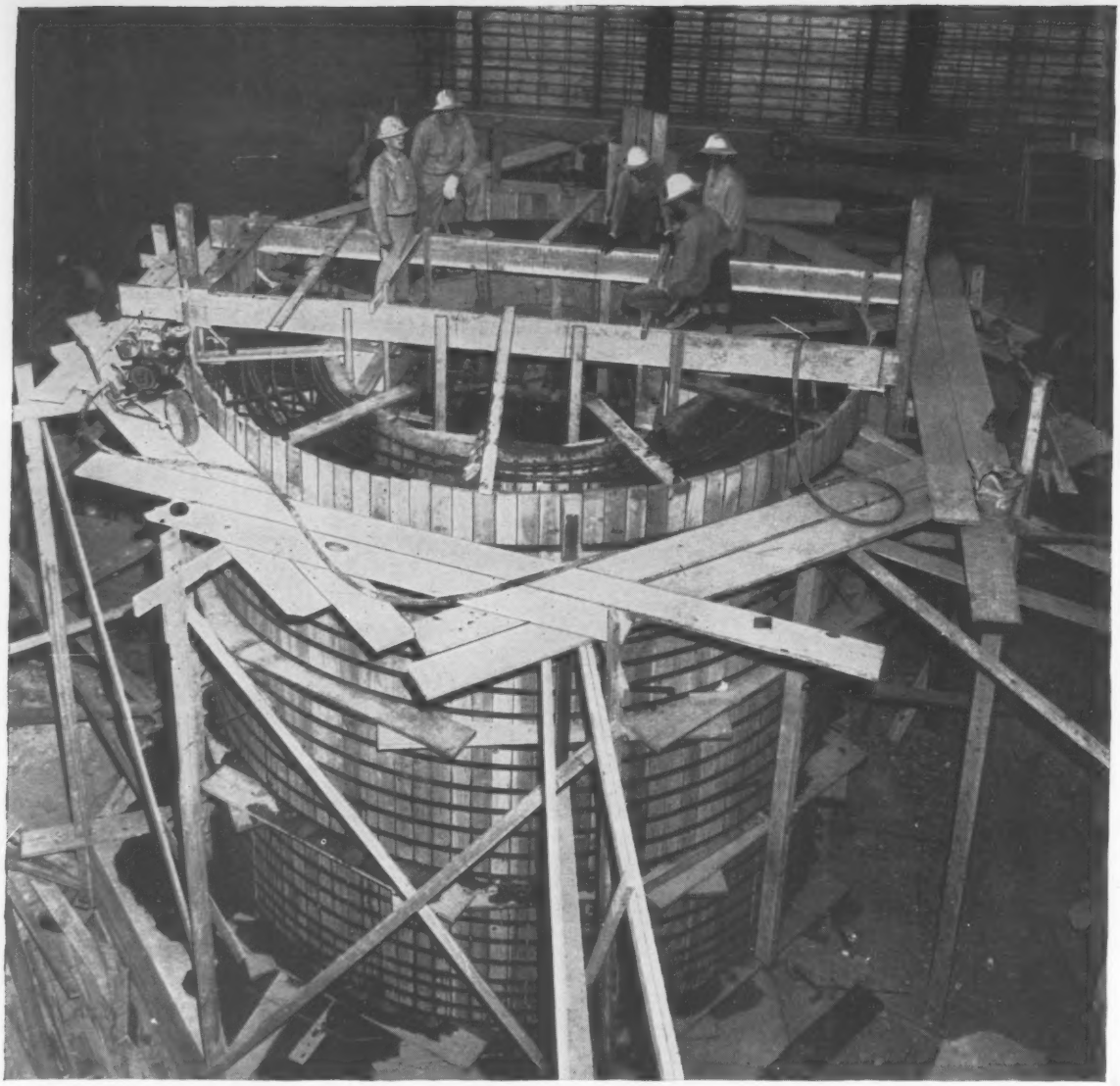
According to Hockman, Hungarian workers are being paid $1.00 to $1.65 an hour for work that carries a union scale of $3.55.

"We all want to help these unfortunate people", Hockman said, "but we believe they can be helped without lowering American wage and living standards".

The union spokesman pointed out that competent workmen may be accepted as union journeymen and that those with inadequate experience to

PRESSTITE
No. 99*
THE TOUGHEST, MOST ECONOMICAL SEALER AVAILABLE for AIRFIELD PAVING JOINTS
■ Resists being BLASTED OUT by terrific jet engine thrust.
■ Resists MELTING and BLOWOUT from super-elevated temperatures from jet after-burners.
■ Resists SHOCK and IMPACT from heavy aircraft.
■ Unaffected by jet fuel spillage.
WRITE for illustrated copy of Bulletin 99
■ A Two-Component, Cold-Applied Sealer
■ For Sealing Sawed and Formed Joints
* Meets Federal Specification SS-S-170, 23 May 1955
USAF

PRESSTITE SEALING COMPOUNDS
PRESSTITE-KEYSTONE ENGINEERING PRODUCTS COMPANY
K A P
A Division of AMERICAN-MARIETTA COMPANY
3738 CHOUTEAU AVENUE, ST. LOUIS 10, MISSOURI



This casting hub is the foundation for an electric furnace under construction at a copper refinery in the West. It is 24 feet high, 18 feet in diameter. Walls are four feet thick, will take approximately 158 yards of concrete. The form is tied with Signode steel strapping. Comparatively little shoring is used because of the encircling strength of the steel strapping, which is spaced more closely together at the bottom than at the top according to a Signode-developed formula.

The savings are big too!

Signode methods save as much as 33% in labor and material costs for contractors tying forms for residential foundation walls, highway bridge piers, commercial and public buildings, and industrial installations like this one. Here are some reasons:

Signode strapping eliminates form hardware
. . . is easily cut to length from the coil
. . . is tensioned and sealed with tools one man handles readily
. . . is stripped and disposed of quickly when forms are removed
. . . is useful for many bundling jobs on any construction site

The Signode man near you is ready to help you cut form tying costs on your next job. Call him today, or write:

SIGNODE

SIGNODE STEEL STRAPPING CO.

2682 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide.
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

meet union standards are eligible for the union's "improver" system. Workers in that classification, he said, are paid at least 75% of the union scale while completing their training.

Hockman asserted that small union contractors have been hit particularly hard by the refugee policy of their non-union competitors and warned that "unless something is done about it even the larger contractors will be affected".

Labor Briefs . . .

• **Improved service**—A year-old experiment to speed up processing of jobless benefit claims in New York State was last week reported successful. Aimed at bottlenecks caused by mass or seasonal layoffs, standby-crews of trained claims takers, faster check mailing and more sensible checking of eligibility have been introduced.

• **Jurisdiction**—Efforts are underway in Canada to establish a National Joint Board for the settlement of jurisdictional disputes between the building trades. In a memorandum submitted to the Ontario Government this month, the Canadian Construction Association said that Canadian problems should be settled by people "familiar with Canadian conditions, laws and customs" and that "a start has been made."

• **Federal Supremacy**—A state court injunction against union picketing of a construction project in Louisville has been dissolved for lack of jurisdiction. It was ruled that the state court was powerless to act under federal labor law and Supreme Court decisions.

• **Back to work**—Iron workers returned to work on the $46 million Carquinez Bridge project in the San Francisco Bay Area after an 18 day tie-up stemming from a jurisdictional dispute with pile drivers over driving steel piling for falsework to support an anchor arm. The case was referred to the National Joint Board by American Bridge Division of U. S. Steel.

• **Stalled**—A walkout of operating engineers has halted construction work on a multi-million-dollar plant expansion for Magnolia Petroleum Co. in Beaumont, Tex. A dispute with contractors over working conditions is reported as the cause.

• **St. Lawrence Seaway**—A strike is threatened on the St. Lawrence Seaway by American seamen in protest against a limitation imposed by Canada on the number of U. S. workers who can be employed on the deepening of the Amherstburg Channel on the Canadian side of the Lower Detroit River. The Great Lakes Dredge & Dock Co. of Cleveland reportedly will employ 100 Canadians and only 39 Americans.

OFFICIAL PROPOSALS

Bids June 19, 1957

City of Elizabethton, Tennessee Construction of Interceptor Sewers

LEGAL NOTICE TO BIDDERS

Sealed proposals for the construction of Interceptor Sewers will be received by the Mayor and Board of Commissioners of the City of Elizabethton, Tennessee, at the City Hall until 11:00 a.m. Eastern Standard Time on the 19th day of June 1957 and will be immediately opened and publicly read.

The work to be done consists of installing approximately 8700 feet of 24" sewer, 2750 feet of 21" sewer, 4300 feet of 18" sewer and two inverted siphons of cast iron pipe. The interceptor sewer will be let in one contract at the complete discretion of the City of Elizabethton and not necessarily to the low bidder.

It is the intention of the Mayor and Board of Commissioners to award the contract to the lowest responsible bidder.

The Mayor and Board of Commissioners reserve the right to reject any and all bids and to waive any informalities or technicalities therein.

Complete sets of the plans and specifications may be obtained from the office of:

ALLEN & HOSHALL
CONSULTING ENGINEERS
65 McCALL AVENUE
MEMPHIS, TENNESSEE

for the sum of $10.00 per set which will be non-refundable.

A copy of the plans and specifications may be examined at the office of the City Manager at the City Hall, Elizabethton, Tennessee.

Each bid must be accompanied by a certified check or Bidder's Bond in the amount of 5% of the Bid and made payable to the City of Elizabethton. The Surety Company issuing the Bidders' Bond shall be licensed to do business in the State of Tennessee.

The successful Bidder will be required to execute a Performance Bond in the amount of 100% of the contract, which shall be made through a local agent.

All Bidders shall be licensed contractors as required by Section 135 of the Public Acts of 1945 of the General Assembly of Tennessee.

No Bidder may withdraw a bid for a period of thirty (30) days after the date set for opening of bids.

THE CITY OF ELIZABETHTON, TENNESSEE.
By William G. Frost
Mayor

Bids: July, 9, 1957.

Lower Allen Township Authority

Sealed proposals will be received by the Lower Allen Township Authority, Gorgas Community Center, 1993 Hummel Avenue, Lower Allen Township, Cumberland County, Pennsylvania until 8:00 P.M. Eastern Daylight Saving Time, at which place and time, or immediately thereafter they will be publicly opened and read, and shall cover furnishing all necessary labor, materials and equipment, and performing all work for the Contracts noted below. Separate proposals will be received upon seven (7) parts of the project as hereinafter indicated. Each proposal shall be accompanied by a certified check or bid bond in an amount not less than ten (10) per cent of the bid total, all in accordance with the provisions of the Contract Documents.

Proposals will be received at the office of Gannett Fleming Corddry & Carpenter, Inc., 600 North Second Street, Harrisburg, Pennsylvania until 5:00 P.M. Eastern Daylight Saving Time, July 9, 1957, or may be delivered (not mailed) to the office of the Authority at the address stated above between the hours of 7:00 P.M. and 8:00 P.M. Eastern Daylight Saving Time on July 9, 1957 only.

Copies of the Contract Documents, including Drawings and Specifications, not to exceed two (2) sets of any particular Contract to a prospective bidder, may be obtained from the office of Gannett Fleming Corddry and Carpenter, Inc., 600 North Second Street, Harrisburg, Pennsylvania. The deposit requested for each set is as follows:

Contract One
CONSTRUCTION OF A SEWERAGE SYSTEM $50.00
(Part A): Construction of Intercepting and Outfall Sewers
Part B): Construction of Highland Park, Yellow Breeches and part of the Cedar Run Trunk Sewers and All Tributary Branch Trunk and Lateral Sewers
(Part C): Construction of part of Cedar Run Trunk Sewer, All Tributary Branch Trunk and Lateral Sewers and Force Main

Contract Two
GENERAL CONSTRUCTION of a SEWAGE TREATMENT PLANT AND PUMPING STATION.....$30.00

Contract Three
PLUMBING WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT AND PUMPING STATION.....$20.00

Contract Four
HEATING WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT AND PUMPING STATION.....$20.00

Contract Five
ELECTRICAL WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT AND PUMPING STATION.....$20.00

Full refund will be made only to actual bidders on the five (5) Contracts noted above, for return of one (1) set, no more, of a particular Contract in good condition within fifteen (15) calendar days after closing date for receipt of bids; refund for return of all other sets in good condition within the same period, will be fifty (50) per cent of deposit. No refund of deposit will be made for Contract Documents returned later than fifteen (15) calendar days after date of receipt of bids.

Copies of the Contract Documents, including Drawings and Specifications will be on file for inspection purposes at the office of Gannett Fleming Corddry & Carpenter, Inc., at the address stated above and also at the office of the same company at 5823 Penn Avenue, Pittsburgh, Pennsylvania.

The Authority reserves the right to reject any and all bids and also reserves the right to waive irregularities in said bids or proposals.

Gannett Fleming Corddry & Carpenter, Inc.,
Engineers, 600 North Second Street Harrisburg, Pennsylvania

LOWER ALLEN TOWNSHIP AUTHORITY
Lower Allen Township
Cumberland County, Pennsylvania

Bids: July 15, 1957

Government of Iraq Electrification of Basrah Power Project — Contract No. (7) Structural Steelwork & Reinforcing Bars

The Development Board and Ministry of Development of the Government of Iraq invite tenders from qualified firms for the supply and delivery, of structural steelwork and reinforcing bar for Basrah Power Station.

Full information regarding this tender can be obtained on and after May 13, 1957 from Embassy of Iraq in Washington or Messrs. Ewbank and Partners, 10/11 Grosvenor place, London, S.W. 1.

All Tender Documents are to be submitted in English to the Ministry of Development, on or before 12 noon, local time, on July 15, 1957.

Minister of Development.

U. S. Government

GOVT. OF DIST. OF COL., DEPT. OF HIGHWAYS, May 20, 1957. SEALED PROPOSALS will be recd. in Rm. 404, 499 Pa. Ave., N.W., Wash. 1, D. C., until 2 PM, EDT, June 17, 1957, and then publicly opened and read for constr. Super-Structure of a Steel Girder Bridge Carrying Anacostia Freeway over PB & W Railroad Yards (Contract No. 2), Fed. Aid Project No. I-IG-IN-ING-FGI-05-1(4), consist. of approx. 3,103 cu. yds. superstructure concr.; 846,260 lbs. reinf. steel; 3,610,430 lbs. struct. lowalloy steel; 3,119,737 lbs. struct. carbon steel and 2,934 lin. ft. alum. handrail and guardrail. (Minimum wage rates for this project have been predetermined as required by law and are set forth in the bid proposal.) Proposal forms, plans and specns. obtainable from Supervisor, Contr. & Bond Section, Procurement Office, D. C., Rm. 406, 499 Penn. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to Collector of Taxes, D. C. (Tel. NA 8-6900, Ext. 2378).

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.10 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, P.O. Box 12, New York 36, N. Y.

Bids: June 6, 1957.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 6th day of June 1957, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1; G. L. Nickerson, District Engineer, 353 Broadway, Albany, N. Y.						
Albany & Rensselaer	TABS 57-39E	New York State Thruway-Berkshire Section (Hudson River Bridge and Approaches)	1.44	Electrical Facilities	$10,500 Plans $15	$190,000
Saratoga (Rte. 9N)	FARC 57-67	Saratoga-Greenfield, S.H. 443 Project S-237(3)	0.58	Asph. Conc., Opt.=0.54 Mi.; Misc Work=0.04 Mi. 20′ Multiplate Arch Br.	$10,000	179,000
Saratoga (Rte. 29)	FARC 57-68	East Galway-Saratoga, Pt. 2, S.H. 5711 Project F-340(5)	0.09	Asph. Conc., Opt.=0.05 Mi.; Misc. Work=0.04 Mi. 23.1′ Multiplate Arch Br.	$4,000 Plans $10	69,000
DISTRICT No. 2; Lacy Ketchum, District Engineer, 109 No. Genesee St., Utica; N. Y.						
Herkimer (Rte. 29A)	FARC 57-74	Salisbury Center-Stratford, S.H. 464 Project F-555(8)	0.63	Asph. Conc., Opt.	$10,000 Plans $10	186,000
DISTRICT No. 3; Wm. Robinson, District Engineer, Weigh Lock Building, Syracuse, N. Y.						
Oswego	FISH 57-9	Interstate Route 5 (Brewerton-Central Square) (Oneida Lake Bridge). Project I-1118(9)	0.17	Cem. Conc. Pavt.=0.09 Mi.; Asph. Conc.=0.08 Mi. Superstructure only for Steel Arch Bridge 448′	$125,000 Plans $25	2,304,000
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester, N. Y.						
Livingston & Ontario (Rte. 65)	FARC 57-75	West Bloomfield-Honeoye Falls, S.H. 455; West Bloomfield-Honeoye Falls, Pt. 2, S.H. 1318. Project S-462(1)	0.16	Asph. Conc.; Opt. I-Beam Bridge 97′	$8,000 Plans $10	150,000
Ontario (Rte. 14& 96)	FARC 57-71	Geneva-Lyons, Pt. 2, S.H. 5252; Phelps-Junius, Pt. 1; S.H. 5437 and West Junius-Waterloo, Pt. 1, S.H. 8056 Project F-1013(3)	1.26 (1.72 Acc.)	9″ Cem. Conc. Pavt. 2 @ 24′ Wide=1.15 Mi.; Cem. Conc. Pavt. on Ramps=1.58 Mi.; Double Surface Treatment=0.14 Mi.; Misc. Work=0.11 Mi.; Hy Sep. Comp. I-Beam 173′	$58,000 Plans $15	1,011,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, 65 Court St., Buffalo, N. Y.						
Erie (Rte. 5)	FAC 57-6 FAC 57-7	City of Buffalo: Arterial Route and City of Lackawanna: Arterial Route (Fuhrmann Blvd.-Hamburg Turnpike Viaduct). Project U-750(11)	1.13	Viaduct Steel Superstructure	$285,000 Plans $25	5,207,000
DISTRICT No. 6, J. H. Thomas, District Engineer, 30 West Main St., Hornell, N. Y.						
Allegany (Rte. 19)	FARC 57-56	Genesee-Stannards Corners, S.H. 1849; Wellsville-Hallsport, S.H. 945. Project F-1121(1)	8.60	Asph. Conc.; Opt. Repair Exist. Truss Br.; Repair Exist. R.C. Open Box Br.	$70,000 Plans $25	1,377,000
Allegany (Rte. 70)	R.C. 57-57	Van Scoters Corners-Canaseraga-Garwoods, S.H. 1366	0.03	Asph. Conc., Ty. 1A Repairs to Existing Br.	$1,000 Plans $10	18,000
Steuben (Rte. 248)	FARC 57-62	Canisteo-Whitesville, Pt. 4, S.H. 8104 Project F-367(4)	0.65	Asph. Conc., Opt. Comp. I-Beam Br. 158′	$18,000 Plans $10	335,000
Steuben (Rte. 17)	FAC 57-5 FASH 57-11	Painted Post-West City Line of Corning, Pt. 2; Corning City: West City Line-Chestnut Street Project U-225(11)	1.79	Asph. Conc.=1.40 Mi.; Misc. Work=0.39 Mi.; Triple R.C. Box Br. 78′ Comp. Deck Girder Br. & RR Sepa. 1377.2′	$230,000 Plans $50	4,239,000
DISTRICT No. 7; R. W. Sweet, District Engineer, 444 Van Duzee St., Watertown, N. Y.						
Jefferson	FISH 57-12	Interstate Route 5, Sect. 7C-2 (Arsenal Street to New Military Road); Ramps; Parking Area, Temporary Detour, Coffeen Street and S.H. 1182 Project I-1118(13)	4.82 (2.84 Acc.)	Asph. Concrete; 4 Hy. Seps. Comp. I-Beam 219′; 205.5′, 144.3′ & 144.3′; 2 Brs. Comp. I-Beam 352′ and 352′; 2 Brs. R.C. Twin Boxes 30′ and 30′; 1 RR Sep. Comp. I-Beam 205.5′	$300,000 Plans $100	5,174,000
Jefferson & Lewis (Rte. 3)	FARC 57-69 FGRC 57-70	Fargo-Natural Bridge, S.H. 8190; Natural Bridge-Harrisville, Pts. 1, 1A & 2, S.H. 8130-5725-8213 Project F-FG-273(3)	7.30	Asph. Conc., Opt. RR Sep. Comp. I-Beam 54′ Twin R.C. Open Box Br. 32′	$108,000 Plans $50	1,969,000
DISTRICT No. 8, K. G. Rauer, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Putnam (Rte. 311)	FARC 57-76	Towners Corners-County Line, S.H. 585 Project S-477(1)	0.62	Asph. Conc., Opt.=0.60 Mi.; Misc. Work=0.02 Mi. Comp. I-Beam Br. 66′	$15,000 Plans $10	246,000
Westchester	FISWC 57-1 H.T. 57-2	New York State Thruway-Southern Westchester Connection-Sub. 11 (N.Y.C. Line-Tuckahoe Road Pts 1 & 2) and Hudson Section, Sub. 10 (Tuckahoe Road-Tarrytown). Project I-1100(2)	4.33	Lighting	$18,000 Plans $15	325,000
Westchester	FISWC 57-2	New York State Thruway-Sub. 11 Southern Westchester Connection (N.Y.C. Line-Tuckahoe Road). Project I-1100(3)	3.98	Chain Link Fence; Bit. Mac. Shoulders; Guide Rail and Misc. Work	$10,000 Plans $10	179,000
DISTRICT No. 9; J. C. Frederick, District Engineer, 71 Frederick St., Binghamton, N. Y.						
Delaware (Rte. 30)	FARC 57-65	East Branch-Downsville, S.H. 8206; Downsville Hamlet: Main St., Maple Ave. and Creamery St., S.H. 1273 Project S-464(1)	14.81	Asph. Conc.; Opt.	$155,000 Plans $50	2,830,000
Delaware (Rte. 206)	FARC 57-73	Walton Village: Bridge St. and Stockton Ave., S.H. 9347 Walton-Downsville, Pt. 1, S.H. 8515. Project S-44(5)	0.74	Asph. Concrete	$9,000 Plans $10	179,000
Schoharie (Rte. 30 & 145)	FARC 57-66	Middleburg-Franklinton, Pt. 1, S.H. 1572; Schoharie-Middleburg, S.H. 5444 and Middleburg-Breakabeen; S.H. 5577. Project F-553(5)	0.17	Asph. Conc.; Opt.; Comp. I-Beam Br. 348′	$30,000 Plans $10	553,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal. Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: July 15, 1957.

Power Authority of the State of New York
Niagara Power Project

ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF 200,000 HP HYDRAULIC TURBINES FOR LEWISTON POWER PLANT
SPECIFICATIONS NO. PA-N-24002
NIAGARA CONTRACT NO. NP 3

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the design, manufacture, and furnishing of 200,000 HP hydraulic turbines and delivery thereof f.o.b. Model City, New York, until 10:30 A. M. Eastern Daylight Saving Time on the 15th day of July at the Authority's office, 18th Floor, The Coliseum, 10 Columbus Circle, New York 19, New York at which time and place proposals will be publicly opened and read aloud.

Bids will be entertained for 6, 7 or 13 turbines and associated equipment and services in accordance with the bidding schedules.

Bids will not be restricted to American manufacturers.

Plans, Specifications and Proposal Forms for the work, may be obtained from the Power Authority of the State of New York, at 270 Broadway, Room 1300 until May 29, 1957 and after June 1, 1957 at The Coliseum, 18th Floor, 10 Columbus Circle, New York 19, New York upon application and prepayment of a fee of Ten ($10.00) dollars per initial set of contract documents, and Five ($5.00) dollars per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall and Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made in duplicate in accordance with instructions contained in the information for Bidders. Guarantee will be required with each bid in an amount not less than 10 percent of the maximum price bid for any bid schedule.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

PA-N-24002

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4912) will be received at Kanab, Utah, until June 19, 1957, for furnishing labor and materials for Sewage Treatment Plant for Page, Arizona, Glen Canyon Unit, Colorado River Storage Project, Arizona-Utah. Location near Lee's Ferry, Arizona. Principal items are 38,000 cu. yds. excavation; constructing concrete sewage plant structures; installing Government-furnished mechanical equipment; and other work. Completion time 180 days. For particulars, address Bureau of Reclamation, P. O. Box 267, Kanab, Utah, or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4915) will be received at Rupert, Idaho, until June 20, 1957, for furnishing labor and materials for Earthwork and Structures for Laterals from Main Canal East, Main Canal West, and Wells in Area 6, Michaud Flats Project, Idaho. Location near American Falls, Idaho. Principal items are 200,000 cu. yds. excavation; 530 cu. yds. concrete in structures; furnishing and laying 12,140 lin. ft. concrete pipe; and other work. Completion time 280 days. For particulars, address Bureau of Reclamation, Rupert, Idaho; or Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

Contractors Watch This Section—

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

OFFICIAL PROPOSALS

Bids: June 6, 1957

New York State Road Work

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, Albany, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m., Advanced Eastern Standard Time, on June 6, 1957, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATION AT VARIOUS SITES ON ROUTE 9 RECONSTRUCTION OF CROTON-RIVER-PEEKSKILL, SH 657, IN WESTCHESTER COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-104

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. K. G. Rauer, District Engineer, New York State Department of Public Works, Pleasant Valley Road, Poughkeepsie, New York.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's Estimate of cost for this work is $36,350.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1850.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

Bids: June 5, 1957

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. on Wednesday, June 5, 1957

For painting the Henry Hudson Bridge and incidental structures, Boroughs of the Bronx and Manhattan, City of New York, Contract No. HM-6.

Each bid must be accompanied by a deposit in the amount of $7,000.00.

Deposit for contract documents is $5.00, to be refunded upon return of the documents in good condition within 30 days after the opening of bids.

Contract documents and further information may be obtained at the office of the Authority.

Bids: July 16, 1957

Philadelphia, Penna.
Procurement Department
Water Department

Sealed proposals will be received in Room 315, City Hall Annex, until 2:30 P.M., Daylight Saving Time, Tuesday, July 16, 1957, and opened at that time, for Bid No. 2821—Contract No. 710-W.

PRE-TREATMENT BUILDING AND EQUIPMENT
TORRESDALE FILTER PLANT
STATE ROAD AND PENNYPACK STREET

DESCRIPTION OF WORK

This contract will consist of the construction of substructure and superstructure and all appurtenant structures for Pre-Chemical Treatment Building including all piping; valves; sluice gates; meters; rapid mixing equipment; railroad scales and track; elevators; chemical storage bins and tanks; chemical feed machines and mixing equipment; chemical pumps, solution lines and feed systems; chemical handling equipment; sludge pumping equipment and disposal lines; outside water lines; chemical operating and control systems; control and indicating panel boards; liquid level systems and all other equipment facilities for a complete operating unit having a maximum capacity of approximately 425 million gallons daily.

Proposal forms, specifications, questionnaires and blueprints may be obtained from the Water Department, in Room 1131 City Hall Annex, Juniper Street and Filbert Street, Philadelphia 7, Penna. A deposit of forty (40) dollars in cash or certified check is required for each set of blueprints and specifications. This deposit will be refunded upon return of the blueprints, unmarked and in undamaged condition within ten (10) days after bids are received.

No bids will be received unless bidder is qualified by the Procurement Commissioner. The questionnaire form with all questions fully answered must be filed with the Water Commissioner, 1106 City Hall Annex, Philadelphia 7, Pennsylvania, at least one (1) week prior to the date of opening bids. Each proposal must be accompanied by security in form and amount as set forth in the proposal.

Bids: June 4, 1957

Ocean City-Longport Bridge Deck Reconstruction of South Approach Beam Spans

CAPE MAY COUNTY BRIDGE COMMISSION
CAPE MAY COURT HOUSE, NEW JERSEY
Dated: May 7, 1957

Sealed bids for the deck reconstruction of the south approach beam spans of the Ocean City-Longport Bridge will be received by the Cape May County Bridge Commission in its offices at Cape May Court House, New Jersey, until 2 P.M. Eastern Daylight Saving Time, June 4, 1957 and then at said place, publicly opened and read aloud.

The work consists generally of replacing the existing concrete deck on the thirteen 35-foot rolled beam simple spans which form part of the south approach of the Ocean City-Longport Bridge as shown on the Plans.

The Information for Bidders, Proposal, Contract, Contract Bond, Plan and Specifications may be examined at the office of the Commission, First National Bank Building, Cape May Court House, New Jersey, and at the office of Howard, Needles, Tammen & Bergendoff, Consulting Engineers, 99 Church Street, New York 7, New York.

Contract documents will be furnished for $5.00 for each set, upon application to the Commission or to the Consulting Engineers. The payment will not be refunded and contract documents are not required to be returned.

The Contract will be awarded or the proposals rejected within thirty (30) days from the date of opening proposals. The Commission reserves the right to waive any informalities in and to reject any or all bids.

Cape May County Bridge Commission
Charles B. Middleton, Chairman

Bids: June 4, 1957

Test Borings Contract 449

SEALED BIDS will be received by the Board of Water Supply at its offices, thirteenth floor, 120 Wall Street, New York City until 11:00 A.M. Eastern Daylight Saving Time (10:00 A.M. Eastern Standard Time) on Tuesday, June 4, 1957 for Contract 449, for drilling two vertical test borings in Upper New York Bay to determine the elevations, nature and conditions of the bed rock, and the depths and character of the overlying materials. Borings will be made from the surface of the water through the materials overlying the rock and into bed rock. Each boring shall penetrate 200 feet or more into sound bed rock as ordered but not more than 500 feet.

Pamphlets of the contract containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in the Secretary's office, Room 1312 at the above address, upon application in person or by mail, by depositing the sum of $5.00 for each pamphlet. Within 30 days following the award of contract or rejection of bids the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet returned in acceptable condition.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners; Board of Water Supply; BETTY COHEN, Acting Secretary.

OFFICIAL PROPOSALS

Bids: June 20, 1957

Power Authority of the State of New York Supplemental Transmission Work

ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF STRUCTURAL STEEL FOR ADIRONDACK SUBSTATION
SPECIFICATIONS NO. PA-8-3
CONTRACT NO. TP 9

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the shop detailing, fabrication and furnishing of structural steel for the Adirondack Substation and the transmission line towers adjacent to the Adirondack Substation and delivery thereof f.o.b. destinations, until 10:30 A.M., Eastern Daylight Saving Time, on the 20th day of June, 1957, at the Authority's office, 18th floor, The Coliseum, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

Bids will be received for the structural steel for the Adirondack Substation and the transmission line towers adjacent to the Adirondack Substation in accordance with the bidding schedules. Estimated quantity for substation 80 tons; for transmission line towers 40 tons. Erection at the site of installation will be done by Others. Delivery will be required starting September 15, 1957.

Plans, Specifications and Proposal Form may be obtained only from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, until the 29th day of May, 1957, and thereafter at The Coliseum, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) for initial set of Contract Documents and Five Dollars ($5.00) for each additional set, no part of which will be refunded. Two sets must be returned with each bid.

Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the office of the Engineer, Uhl, Hall and Rich, 230 Congress Street, Boston 10, Massachusetts, for the inspection by prospective bidders.

Bids will not be restricted to American manufacturers.

Bids must be made in duplicate in accordance with the instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than ten per cent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

PA-8-3

U. S. Government

BRIDGE CONSTRUCTION—U. S. Army Engineer District, Memphis, Corps of Engineers, P. O. Box 97, Memphis 1, Tenn. Sealed bids will be received at this office until 1:30 P.M. C.S.T., 11 June 1957, and then publicly opened, for constructing four county bridges across St. Francis River in St. Francis and Lee Counties, Arkansas. $25.00 deposit required on plans. Information on request.

GOVT. OF DIST. OF COL., DEPT. OF HIGHWAYS, May 20, 1957. SEALED PROPOSALS will be recd. Rm. 404, 499 Pa. Ave., N.W., Wash. 1, D. C., until 2 PM, EDT, June 17, 1957, and then publicly opened and read for constr. Sub-Structure of a Steel Girder Bridge carrying Anacostia Freeway over PB & W Railroad Yards (Contract No. 1), Fed. Aid Project No. I-IG-IN-ING-FGI-05-1(4), approx. quant. incl. 21,100 cu. yds. unclass. excavation; 3,983 cu. yds. structure excavation; 71,765 cu. yds. backfill and fill; 2,252 cu. yds. footing concrete; 4,150 cu. yds. wall concr.; 642,900 lbs. reinf. steel; 118,300 lin. ft. cast-in-place concr. piles; 5,814 cu. ft. stone masonry facing; and 3,000 lbs. struct. carbon steel. (Minimum wage rates for this project have been predetermined as required by law and are set forth in the bid proposals). Proposal forms, plans and specns. obtainable from Supervisor, Contr. & Bond Section, Procurement Office, D. C., Rm. 406, 499 Penn. Ave., N.W., upon deposit of a certified check for $40.00 per set, payable to Collector of Taxes, D. C. (Tel. NA 8-6000, Ext. 2378).

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4918) will be received at Denver, Colorado, until June 25, 1957, for furnishing fourteen motor-driven, horizontal, centrifugal-type pumping units, with capacities ranging from 3.2 cfs to 16 cfs and with heads ranging from 220 feet to 900 feet, for five pumping plants of the Ventura River Project, California. Delivery is desired within 365 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

U. S. Government

OFFICIAL PROPOSALS

Bids: June 19, 1957.

City of Elizabethton, Tennessee Construction of a Municipal Sewage Treatment Plant

LEGAL NOTICE TO BIDDERS

Sealed Proposals for the construction of a municipal Sewage Treatment Plant will be received by the Mayor and Board of Commissioners of the City of Elizabethton, Tennessee, at the City Hall until 11:00 a.m. Eastern Standard Time on the 19th day of June 1957 and will be immediately opened and publicly read.

The work consists of the construction of a 2.0 MGD Primary Sewage Treatment Plant with sludge dewatering equipment and includes a primary pumping station.

It is the intention of the Mayor and Board of Commissioners to award the contract to the lowest responsible Bidder.

The Mayor and Board of Commissioners reserves the right to reject any or all bids and to waive any informalities or technicalities therein.

Complete sets of the plans and specifications may be obtained from the office of:

ALLEN & HOSHALL
CONSULTING ENGINEERS
65 McCall Avenue
Memphis, Tennessee

for the sum of $15.00 per set which will be non-refundable.

A copy of the plans and specifications may be examined at the office of the City Manager at the City Hall, Elizabethton, Tennessee.

Each bid must be accompanied by a Certified Check or Bidder's Bond in the amount of 5% of the Bid and made payable to the City of Elizabethton. The Surety Company issuing the Bidder's Bond shall be licensed to do business in the State of Tennessee.

The successful Bidder will be required to execute a Performance Bond in the amount of 100% of the Contract, which shall be made through a local agent.

All Bidders shall be licensed contractors as required by Section 135 of the Public Acts of 1945 of the General Assembly of Tennessee.

No Bidder may withdraw a bid for a period of thirty (30) days after the date set for opening of bids.

THE CITY OF ELIZABETHTON,
TENNESSEE
By William C. Frost
Mayor

OFFICIAL PROPOSALS

Bids: June 18, 1957.

Contract BP-140.007

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHORITY PIERS
PIER 2
DEMOLITION OF PIERS 9 & 9½

Sealed proposals for the demolition of Piers 9 & 9½ at the Brooklyn-Port Authority Piers will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, June 18, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman
New York, May 30, 1957

EMPLOYMENT OPPORTUNITIES

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Designers - Electrical - Piping - Struct. Power Plants and Industrial Buildings. Marbarry Corp. 120 Greenwich St., New York City 6, N. Y. REctor 2-8749.

Gunite Superintendent—Wanted immediately. Middle Atlantic States. State age, experience, availability, salary desired. P-4640, Engineering News-Record.

City Engineer: Registered professional engineer desired for City of approximately 18,000. Municipal experience desired, but not mandatory. Full details of education, experience and qualifications should be furnished. Contact Mayor, Fremont, Nebraska.

Estimator—for leading, established eastern Mass. highway, bridge and waterfront contractor. Extensive experience in heavy construction necessary. Resume and salary requirement to P-5071, Engineering News-Record.

Teaching—Structures, Highways, Fluid Mechanics Specialists at assistant or associate professor level. Opportunity to engage in research at Fritz Engineering Laboratory. Also openings as graduate teaching and research assistants and instructors, with opportunity for advanced degrees. Head, Dept. of Civil Engrg. Lehigh University, Bethlehem, Pa.

Engineers on water works, sewerage and sewage treatment projects. Experienced in design and plan preparation for sanitary projects or work of related type. Opportunity for permanent connection with Ohio consulting firm in long established practice. Please provide full details of experience, education, references and salary. P-5047, Engineering News-Record.

POSITIONS VACANT

Engineering Graduates with experience in the testing and control of concrete, asphalt and soils for work abroad. Give full details of experience and education. Salary range $8000.00 to $10,000.00 per year. P-5104, Engineering News-Record.

Wanted—Aggressive manager for growing 25 man structural fabricating shop, midwest location. Write stating qualifications and compensation desired. P-5093, Engineering News-Record.

College Instructor—Young Engineering Graduate. Some industrial experience desirable. Opportunity to work on advanced degree. Write: Head, Department of Engineering Drawing, Iowa State College, Ames, Iowa.

Estimator-Project Manager or Assistant for building construction. Well established, growing Company in Rhode Island. Three to Five years contractor experience desirable. Good opportunity for advancement. P-4970, Engineering News-Record.

Experienced Steel Detail Checker. Must have minimum of 8 years detailing experience. Assistant to Chief Engineer. Will supervise and check work of detailers, handle job correspondence and scheduling. Will be trained to do steel estimating. Good salary, usual vacation and benefits plus profit sharing plan. Send resume and references to—Michigan Fabricating and Welding, 1950 Wellworth St., Jackson, Michigan.

Electr. and Mech. Project Engrs., Design Ltg. Power & Comm. Systems; Design Heat-Vent-Air Cond., Com'l & Ind'l Bldg. Pers. Mgr. 321 S. Beaudry, Los Angeles 17, Calif.

Two Teachers, Mechanics, Applied Electricity, General Physics. One Head of Department, Ph.D. engineering preferred. B.S. or M.S. also considered. Salary and rank dependent on qualifications. Salary scale good. Room for advancement. Apply President, Montana School of Mines, Butte, Montana.

(Continued on opposite page)

EMPLOYMENT OPPORTUNITIES

DISPLAYED

The advertising rate is $31.80 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

—RATES—

UNDISPLAYED

$2.10 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.
Position Wanted ads take ½ of above rate.
Box Numbers—count as 1 line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Not subject to Agency Commission.

Send NEW ADS and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD
P. O. Box 12, N. Y. 36. June 13th issue closes June 3rd

POSITIONS VACANT

(Continued from opposite page)

Structural Steel Detailer. Must be experienced in both structural and miscellaneous steel detailing. Good working conditions in new office building with company of 70 years standing. Excellent climate, good living conditions. Give full particulars. Write or phone Tucson Iron Works, Box 1949, Tuscon, Arizona.

College Business Office—Assistant, preferably with engineering background, for administrative work assisting in general supervision of maintenance; plant operations, including dormitories, dining halls, and faculty housing; purchasing; new construction; and auxiliary activities. At large eastern college in attractive rural location. Previous institutional experience not required. Prefer man under 35. Write, giving age, experience, salary requirements, and enclose photograph. P-5246, Engineering News-Record.

Superintendent, Building Construction. Highly capable superintendent wanted for company operating in middle eastern states. Should be completely experienced in concrete work. Furnish details as to experience, references, education, salary expected and when available. P-5203, Engineering News-Record.

Project Engineer to Head Up Inspection & Testing Group (Soils, Concrete & Asphalt) on construction of Overseas Airbase. Temperate Climate. P-5208, Engineering News-Record.

Plant Superintendent—for Concrete Products Plant in Midwest. Must be well experienced in the Concrete Products or Construction field. Salary and percentage bonus. Send complete details on experience qualifications. P-5216, Engineering News-Record.

Young engineer needed for field and office work with established sail foundation firm covering the Mid-Atlantic States. Work will be out of Washington, D. C. office. Write to Spencer, White, & Prentis, Inc., Rm 236, Tower Bldg., Washington, D. C. or call Harry Schnabel, St. 3-0580.

Superintendent For Concrete Bridge Foundations and Decks. Man with carpenter background preferred. Write Merritt-Chapman & Scott Corp., 10 Village Street, East Hartford, Conn.

POSITIONS WANTED

Dredging Engineer. All phases. Layout, design, supervision, operation, hydro-graphic surveying, inspection. Will contract for individual jobs anywhere in world. Graduate, registered, 40 years old, self-employed. Reference and record on request. John Huston, Corpus Christi, Texas. TErminal 5-7493.

Mechanical Engineer — Age 31 — contracts manager, project engineer—supervisor machinery and mechanical equipment installation. 8 years experience heavy construction foreign and domestic, field and office. Excellent references. Seeking opportunity N.Y.C. or vicinity metropolitan area. PW-4764, Engineering News-Record.

Chief Estimator, B.C.E., 10 yrs. heavy construction experience, excavation, utilities, paving, structures. Prepare bids, payments, subs, costs, admin. P.E. license N.Y. & N.J. Prefer N.Y., N.J. or Conn. PW-5095, Engineering News-Record.

C.E., 26, Associate, learn with small, local contractor. Field, office. Anywhere. PW-5084, Engineering News-Record.

Heavy Equipment School Director and Assistant Director, thoroughly experienced in all phases of organization and operation, to train heavy equipment operators. Best references. PW-5144, Engineering News-Record.

Continued on page 126

OPPORTUNITY FOR YOUNG GRADUATE ENGINEERS

WITH

Sverdrup & Parcel Engineering Co.

1134 LOCUST ST. ST. LOUIS 1, MO.

Additional Openings for

DESIGNERS DETAILERS

Overseas Openings Available For Engineers 30 to 45
With Extensive Experience In Highway Engineering

WORK AND ADVANCE IN PROFESSION OF HIGHWAY ENGINEERING WITH HIGHLY SKILLED ASSOCIATES IN A GOOD PLACE TO WORK. PERMANENT POSITIONS FOR QUALIFIED MEN. PERIODICAL REVIEWS OF SALARY. LIBERAL EMPLOYMENT BENEFITS, RETIREMENT AND INSURANCE PLANS.

Please Write Fully to Above Address

PROJECT MANAGERS

For Marine Work and Highway Construction.

Must be graduate Civil Engineer with minimum of 10 yrs. experience in either field. Based in New York Office, but foreign travel essential.

Give experience and full details in reply to:

P-5227, Engineering News-Record,
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

STRUCTURAL ENGINEER
ELECTRICAL ENGINEER
SPECIFICATION WRITER

Experienced personnel for permanent positions with long-established sanitary engineering consulting firm. Life insurance and other benefits. Salaries Open.

BOGERT and CHILDS
145 East 32nd Street, New York 16, N. Y., MU 3-7712

SALES ENGINEERS

A major steel company has need for sales engineers to promote and sell fabricated products in middle Atlantic states. Excellent opportunities for men 25 to 30 years old with engineering background and a desire for sales work. Attractive starting salary with company car, expenses and bonus plan.

SW-4684, Engineering News-Record,
Class. Adv. Div., P.O. Box 12, N. Y. 36, N. Y.

STAFF ENGINEER MAINTENANCE SERVICES

Foreign Employment

To assist and advise operating management on all maintenance services and practices in major oil installation located in Saudi Arabia. Must be graduate engineer with minimum 10 years planning and operations experience in heavy industrial or refinery installation. Proven supervisory ability and thorough knowledge of maintenance craft methods and equipment required.

High salary plus living allowance and liberal all-inclusive benefits conducive to large savings. Excellent community facilities.

Write outlining background and experience. Please include telephone number.

Recruiting Supervisor, Box 212

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, NEW YORK

KAISER ALUMINUM

A dynamic leader in the production and sale of aluminum offers an outstanding opportunity for personal growth to those who can qualify as

ARCHITECTURAL REPRESENTATIVE

To service architects and engineers on technical problems relative to aluminum applications in the building industry . . . previous background in aluminum not necessary but desirable . . . requires thorough knowledge and understanding of building construction principles and architectural office operations . . . contacts made on executive, design and engineering levels . . . interest in sales and ability to advise salesmen essential . . . college degree in Architecture, Architectural Engineering or Chemical Engineering preferable . . . several locations available. Salary commensurate with ability.

Please reply in full, stating age, education, background and experience to:

Personnel Procurement

KAISER ALUMINUM & CHEMICAL SALES, INC.
919 No. Michigan Avenue
Chicago 11, Illinois

McKEE

has permanent openings for

ENGINEERS
DESIGNERS
—DRAFTSMEN—

in the following categories:

STRUCTURAL
CONCRETE
PIPING
MECHANICAL
ELECTRICAL

BROAD diversification of work in our three engineering divisions assures you security of employment.

TELEPHONE OR WRITE TO
VICTOR HOPKINS

Arthur G. McKee & Company

2300 Chester Ave., Cleveland 1, Ohio
PHONE TOwer 1-2300
Engineering offices in
CLEVELAND, OHIO • UNION, N.J. • TORONTO, ONT.

GRADUATE CIVIL ENGINEER WANTED

by City of Moline, Illinois as Assistant City Engineer for design and supervision of construction of street, water main and sewer projects. Starting salary $6,000 with vacation, sick leave and retirement benefits. Give full resume of experience and date available in first letter to

City Engineer, Moline, Illinois

ASSISTANT TRAFFIC ENGINEER

For Traffic Engineering Department recently established. Salary range $622 to $691 a month with maximum salary obtainable through annual and longevity increases. Registration as a professional engineer required. No residence restrictions for U. S. citizens to begin work. Wisconsin Retirement Fund and Social Security Benefits.

PERSONNEL DEPARTMENT
CITY HALL, MADISON 3, WIS.

THREE POSITIONS AVAILABLE FALL QUARTER — 1957

INSTRUCTOR—CIVIL ENGINEERING—(1) (Male). Subjects to be taught: Engineering Drawing, Descriptive Geometry, Plane Surveying and Mechanics. **Requirements: Minimum:** B. S. Degree. **Salary:** Dependent upon education and experience.

ASSISTANT PROFESSOR: — CIVIL ENGINEERING — (2) (Male). Subjects to be taught: Dependent upon interest and experience. **Requirements:** Minimum B. S. Degree — preferred M. S. **Salary:** Dependent upon interest and experience.

To Whom Apply:
EARL D. DAKE, Head, Civil Engineering Dept.
and Vice-President
School of Mines and Technology
Rapid City, South Dakota

ESTIMATOR

Excellent opportunity with rapidly expanding contractor in midwest. Specific, responsible experience in one or more of the following will be considered valuable: bridges, grade separations, concrete & asphalt paving, city widening & resurfacing projects. Salary commensurate with experience.

P-4999, Engineering News-Record
520 N. Michigan Ave., Chicago, Ill.

ROAD CONSTRUCTION ENGINEER

Asphalt

Graduate engineer with minimum 7 years experience in road construction using liquid asphalt. Some knowledge of manufacturing helpful. To serve as technical advisor to company, government, road contractors and builders in Saudi Arabia.

High salary plus living allowance and liberal all-inclusive benefits conducive to large savings. Excellent community facilities.

Write outlining background and experience. Please include telephone number.

Recruiting Supervisor Box 213

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, NEW YORK

Engineers, Field & Office, Party Chiefs Instrument Men, Rodmen

for long term heavy construction project in Metropolitan area. Give complete resume first letter.

P-5194, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

DESIGN ENGINEERS

Structural Designer with minimum of 5 yrs. experience in Waterfront Design including Piers, Bulkheads, etc.

Structural Designer with minimum of 5 yrs. experience in Reinforced Concrete with Steel Design; capable of handling own work with minimum of supervision.

Permanent Employment—Insurance, Vacation & Retirement Program.

Send complete resume with salary requirements to:

RAYMOND CONCRETE PILE COMPANY
140 Cedar St., N. Y. 6, N. Y.

SAN FRANCISCO CITY AND COUNTY IMMEDIATE EMPLOYMENT POSSIBILITIES VARIETY OF PUBLIC WORKS PROGRAMS

	7-1-57
Junior Engineer (Civil)	$480-$550
Assistant Engineer I (Civil)	$525-$630

For Further Information and Applications, *inquire:*

San Francisco Civil Service Commission
154 City Hall
San Francisco, California

SENIOR BRIDGE DESIGN ENGINEER

FOREIGN EMPLOYMENT

Engineer well versed in design (10—15 years experience) and construction of highway bridges needed to supervise structural program of highway mission in Near East. Country wide operation. Liberal salary, transportation for family plus other attractive allowances and benefits. Send complete resume including list of references.

P-4928, Engineering News-Record,
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

STRUCTURAL
ENGINEERS
DESIGNERS
DRAFTSMEN

Prefer several years or more experience in any of these fields:

BRIDGES

BUILDINGS
EXPRESSWAYS
HYDRO PROJECTS
TEST FACILITIES*

Will consider lesser experience with good educational background, including several recent graduates to round out a planned expansion program. Occasional openings for combination field men. These are permanent additions to our regular staffs.

We are professional engineers engaged primarily in design which covers a wide scope of practice. The variety and unusual character—for example, the proposed world's largest bridge project—offer excellent opportunity for professional development and advancement.

Immediate openings in our St. Louis general offices and occasionally in our San Francisco branch office. Confidential interviews can also be obtained at Washington, D.C., and Portland, Oregon.

Paid vacation, sick leave, holiday, overtime. Excellent Employee Benefits Plan provides retirement income plus life and disability insurance. Blue Cross. Moving allowance.

Please write fully, including salary data, to

SVERDRUP & PARCEL, Inc.

ENGINEERS — ARCHITECTS

915 Olive St. Louis 1, Mo.

*We are designers of the technical facilities for the Arnold Engineering Development Center, operated by our subsidiary, ARO, Inc.

STRUCTURAL ENGINEERS (5 positions)
SANITARY ENGINEERS (3 positions)

$7500 - $10,000

plus

Early eligibility in generous profit-sharing plan.

Type of work:

1. Extended Program of Bridge Design Projects.
2. Design of structures for Water Treatment & Sewage disposal plants.
3. Industrial buildings.

Qualifications:

1. College degree or equivalent in Structural Engineering.
2. Minimum 5 years design experience of which minimum of 3 years should be specifically on overall layouts, design calculations, and design sketches, on type of structures listed above.

Type of work—design of

1. Water Distribution Systems and Treatment Plants.
2. Sewerage Systems and Sewage Disposal Plants.

Qualifications:

1. College degree or equivalent in Sanitary Engineering.
2. Minimum 5 years in various phases of design work on sanitary projects of which a minimum of 2 years should be on layout and design of plants.

FOR PROMPT ACTION provide:

1. Education.
2. Chronological Experience and Salary Record.
3. References—supervisors or registered engineers.
4. When available for interview at our expense.
5. When available for assignment.
6. Salary and moving allowance required to move to Augusta.

PATCHEN AND ZIMMERMAN, ENGINEERS

525 Telfair Street Augusta, Georgia

Research and Development

Two engineers, one recent graduate, one more mature. Experience in research and development in concrete and soils desirable, particularly in highways. Permanent challenging work in Laboratory and field. Desirable facilities in suburb north of Chicago.

P-4934—Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

HIGHWAY DESIGN ENGINEERS

Permanent positions for men with 3 to 8 years experience. Excellent opportunities for advancement, paid vacation, sick leave and hospitalization insurance.

GLACE ENGINEERING CORPORATION
1001 N. Front St. Harrisburg, Penna.

ENGINEERS

Long established firm of consulting engineers with world-wide practice needs both beginners and experienced civil, electrical, mechanical, and foundation engineers for interesting work on large dams, power-plants, and river control works. Permanent positions. Liberal employee benefits. Starting salaries dependent on qualifications. Please send complete resume to Hugo Niemi, Personnel Manager.

HARZA ENGINEERING CO.

400 W. Madison St. Chicago 6, Ill.

FIELD ENGINEER WANTED

Preferably civil engineering graduate with several years field experience by large heavy construction contractor to lay out work, make simple estimates and assist superintendent. Permanent position, location Maryland. Excellent opportunity for ambitious man as several of our executives have started with us in similar positions. Please state age, education, short experience outline, and salary desired.

P-5135, Engineering News-Record,
520 N. Michigan Ave., Chicago 11, Ill.

Highway & Bridge Engineers
Designers & Draftsmen

Career opportunities for men interested in professional recognition.
Excellent working conditions and employee benefits including liberal retirement program.
Openings in Pennsylvania, Maryland, Florida, West Virginia, Mississippi and overseas.

Air Mail Resume TO R. L. SHAW, *Personnel Director*

MICHAEL BAKER, Jr., INC.

BAKER BLDG. ***Consulting Engineers*** **ROCHESTER, PA.**

POSITIONS WANTED

(Continued from page 123)

Civil Engineer, 29, BSCE 51. Completing military tour early Sept. 4 yrs. bldg. constr. experience with contractor—coordinating, expediting, & erection. Seeks responsible, challenging position with small contractor or consultant leading to executive capacity. Prefer location near State of Delaware. PW-5153, Engineering News-Record.

Civil Engineer—Good all-round man, broad experience. South or West. PW-5113, Engineering News-Record.

Project Manager—20 years experience, power plants and heavy industrial work both foreign and domestic. PW-5122, Engineering News-Record.

Superintendent, Field Supervision, constructing Industrial, commercial, Institutional, Large Scale Housing, Churches, etc. Desires similar position with reliable organization. 25 years experience, resident of New Jersey. Can travel. PW-4891, Engineering News-Record.

Chief Draftsman—experienced with structural fabricating co., considering change as chief engineer or chief draftsman with stable co. PW-5182, Engineering News-Record.

Construction Superintendent, 25 years experience supervising large industrial buildings. Specializing schools and monumental buildings. Can travel. PW-5224, Engineering News-Record.

Architectural Engineer, graduate, 10 years exp. in various construction capacities, presently heading own Contracting firm. Background Greek education desires position (Eng. Administrative or sales) in Greece only. PW-5225, Engineering News-Record.

Construction Administrative Executive capable of heading construction program, 25 years wide and diversified experience—heavy in plans and specifications production; budget control; awarding contracts; field management. Registered Architect; Registered professional engineer. Available June 15. PW-5220, Engineering News-Record.

Engineer, Soils, Reg. P.E. 37; BS, MS in C.E. Varied experience: laboratory, design, foundation research and general civil engg. Experience in: earth dam, highway, airfield, structural design and construction control. PW-5221, Engineering News-Record.

Construction Manager—broad experience, desires connection with aggressive firm in West or Southwest. Over 20 years profit making background as Manager, Supervisor, Chief Estimator etc. for outstanding General Contractors on building and heavy construction. P.E. Now employed, available soon. PW-5244, Engineering News-Record.

Process Engineer: Age 35, MSME; ME; Registered Professional Engineer—11 years Design and Supervision of Process Piping and facilities seeks responsible position in Florida or California. PW-5212, Engineering News-Record.

Contractor's Executive, qualified to handle a large project, branch office details, buildings and heavy construction, now managing successful business, seeks connection offering greater scope to top man. Minimum $15,000. PW-5214, Engineering News-Record.

Construction Superintendent or Project Manager thoroughly experienced on all types of projects. Will go anywhere, foreign or domestic. Available immediately. Best of references. PW-5180, Engineering News-Record.

Resident Engineer with 25 years experience on Power Plants, Bridges, Sewage and Water Treatment Plants, Industrial, Commercial and Monumental Buildings. Available immediately. PW-5181, Engineering News-Record.

Looking for supervisor job, any distance. I have 35 years experience in blasting in tunnels, sewers, roads, etc. I'm ready to work in July, I'm willing to work two ways: salary or by the ability to the progress; not last 6 months or more agreement. Write: A. B. Izzo, 827 Morris Park Ave., Bronx, or tel. T.T.A. 2-7000.

Structural Engineer, Reg'd; Univ. grad 1951. Design steel and reinf. concrete structs; supervision design & drafting; field insp. Desire respon. pos. with A & E, mild climate. PW-5184, Engineering News-Record.

SEARCHLIGHT SECTION

(Classified Advertising)

BUSINESS OPPORTUNITIES — **EQUIPMENT - USED or RESALE**

ENGLISH MANUFACTURER WISHES AMERICAN ARTICLE TO MANUFACTURE & SELL

A. & B. MOTORS (Newton-Le-Willows) Ltd. Mill Lane, Newton-Le-Willows, Lancashire, England: Accredited Motor Dealers for British Motor Corporation: Jaguar cars, Rolls-Royce and Bentley etc., HAVE an efficient Engineering Dept—engaged in the production of repetition machined parts: The work on hand is sub-contract for numerous important establishments. The firm is desirous of taking on the manufacture of an American article from start to finish for sale in Great Britain under license. They are equipped with modern machinery with go ahead personnel having the know how to turn out a first class job. Capital available and good representation.
Bankers reference. Westminster Bank Ltd. Earlestown, Newton-Le-Willows, Lancs. Trade reference . . . W. Watson & Co., Ltd., Car Distributors, Bold St., Liverpool.
Replies to:—

A. & B. MOTORS
(Newton-Le-Willows) Limited,
Mill Lane, Newton-Le-Willows,
Lancs. England.

FOR SALE

Land Surveying and Engineering business located in Chicago. Gross sales in 1956 $183,000.00. Three principals can earn $20,000.00 per year each.

Price $60,000.00. Terms can be arranged. Estimated assets—$35,000 to $40,000. Records and Field Notes for four counties.

BO-5195, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

FOR SALE

20" HYDRAULIC DREDGES

1—at Philadelphia, Pa.
1—at Memphis, Tenn.
Including
Pontoon Line & Accessory Plant

DUNBAR & SULLIVAN DREDGING CO.
2312 Buhl Bldg.
Detroit 26, Michigan
Phone WO. 1-2333

3—P&H TRUCK CRANES

20 & 25 TON 80' BOOM
30' JIB. YEAR 1950

A. P. CRANE RENTAL CO.
1230 Randall Ave. New York
Tel. DA 9-5056

EUCLID REAR DUMPS

Two Model 46TD, 22 Ton, 300 H.P. Cummins Diesel Engines, Year 1955, S/N's 19758 and 9

L. B. SMITH, INC.
357 W. Fayette St. Syracuse, N. Y.
Phone—GRanite 5-2196

LOW COST INSTALLATION AND OPERATION

CABLEWAYS

IMMEDIATE SHIPMENT
ELECTRIC, STEAM OR DIESEL
CAPACITY 3 TO 20 TONS
SELL, RENT OR BUY

FOR DAMS, BRIDGES, BREAKWATERS, FILTRATION AND SEWERAGE PLANTS

FOR SPEED, ECONOMY, EFFICIENCY, FLOOD SAFETY, LABOR REDUCTION

AMBURSEN DAM CO. INC.
295 MADISON AVE NEW YORK

Engineers—Foremen—Office Men

Learn latest methods to organize and run work. Prepare for the top jobs.
Send post card for details.

GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
P.O. Box 921 Lake Worth, Florida

REPLIES (Box No.): Address to office nearest you
c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

BUSINESS OPPORTUNITY

For Sale—General Contracting Business— Midwest location. Owners desire retirement and offer a well-balanced business in the following lines. State Highway bridge and special structures prequalifications. Industrial accounts, including new structures, millwright work, and heavy maintenance. Municipal contracts, heavy sewers, power plant and disposal work. Offered as a working organization, complete with personal equipment, land and buildings. BO-5115, Engineering News-Record.

CONTRACT WORK WANTED

Bridgeway Associates. Design, contract drawings, specifications for all types of bridges including long span. Professional Engineers. CWW-4279, Engineering News-Record.

BOOKS AND PERIODICALS

Highway and Railway Bridges with Simple and Continuous Spans, 32p. booklet, by A. A. Fremin, 1541-37 St., Sacramento, 16, California, $4PP.

STRUCTURAL ENGINEERING

ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-third year.
Write today, without obligation.

WILSON *Engineering Corp.*
College House Offices HARVARD SQ., CAMBRIDGE, MASS.

POWER UNIT, DIESEL, 300 HP

One (1) New General Motors, type 6-110, Model 6240 3RA Short Base Open Power Unit complete with muffler, starter, etc., but without battery. Direct connected to a Cotta Model GR12E Reduction Gear 2.20:1 with a 14" two plate clutch.

Walsh, Perini, Morrison, Kiewit, Utah Co's
P. O. Box 106, Massena, N. Y.
Phone: Rockwell 9-2456

UNIVERSAL FORM PANELS

FOR SALE
15,000 S. F. Standard Sizes, with accessories—good condition

THE ARTHUR A. JOHNSON CORPORATION
347 Madison Ave., N. Y. 17, N. Y.
W. J. Keahon—MUrray Hill 6-1070

RB SUBGRADER

20-24' Excellent Condition. Completely overhauled engine, including Cross-over Bridge. $3,000.00

SOUTHERN STATES EQUIPMENT CO. INC.
425 Celeste St. — New Orleans, La.
Phone—RAymond 8577

If there is anything you want
that other readers can supply
OR . . . something you don't want—
that other readers can use—
Advertise it in the
SEARCHLIGHT SECTION

DON'T WAIT
WF-H BEAMS
PILE SECTIONS
NEW · USED · IN STOCK

8″	BP	36#
10″	BP	42#
12″	BP	53#
14″	BP	73#
14″	BP	89#
14″	BP	102#
14″	BP	117#

We are also interested in purchasing your surplus material.

We assure you our prices will be the best obtainable.

Call HY DRACHMAN
STEEL CORPORATION
52-25 2nd Street
Long Island City, N. Y.
Phone: RAvenswood 9-1262

Slightly Used
80D Northwest Double Stick Shovel Attachment
Excellent Condition

HODGE & HAMMOND, INC.
720 Garrison Ave., New York 59, N. Y.
Phone—Kilpatrick 2-2400

PIPE
Surplus New & Used
FOR SALE

PILING · PILE FITTINGS · PIPE CULVERTS · VALVES & FITTINGS
SPECIALISTS IN PRE-FAB. PIPING

ALBERT
PIPE SUPPLY CO., INC.
Berry at North 13 Sts., B'klyn, N. Y.

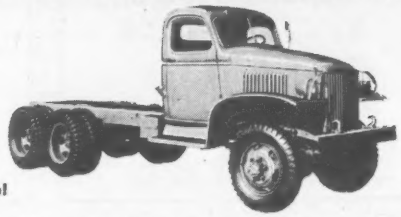
ALBERT PIPE SUPPLY APS

STEEL PIPE *Available* Sizes ½″ to 24″
PIPE FABRICATION
RADIANT PANELS
WELDING & BENDING
Valves & Fittings
All Schedules and Specifications
EDW. SHERMAN CORP.
116-03 Merrick Rd., Jamaica, N. Y.
Laurelton 8-6000

PIPE
VALVES and FITTINGS
All Sizes in Stock
NEW-USED
GREENPOINT IRON & PIPE CO., INC
Bogart and Stagg Streets, Brooklyn, N.Y.

SAVE THOUSANDS!
UNUSED 6 x 6 ARMY TRUCKS

*2½-TON, GMC & INTERNATIONAL



- From Government Storage!
- Unused and Guaranteed!
- Factory-New Condition!
- Reconditioned trucks also available!

Why invest in expensive new trucks and equipment needed to get the roughest off-road jobs done when you can save up to $3,000 on ONE truck alone—and get the job done right!

Compare our tandem axle trucks with front wheel drive, 10 forward speeds, overdrive and new mud and snow tires with similar equipment elsewhere. See for yourself how TWO of our trucks cost you even LESS than one new truck!

If planning to buy a truck, get in touch with us right away. There's no obligation . . . and we deliver on approval!

For Specifications, Prices, Delivery Write, wire or phone COLLECT—JAckson 5-7841
Milton Y. Toombs, Jr. Sales Manager

MEMPHIS EQUIPMENT CO.
Construction and automotive equipment and parts
766 S. THIRD ST. • MEMPHIS, TENN.

PRICED LOW
FOR IMMEDIATE SALE

Unit Model 1020 Trenchoe, serial #2536 rebuilt and guaranteed.

Schield Bantam Model C35, serial #4816 with 35 ft. boom; all controls independent; excellent condition.

Wayne Model 1-450 Street Sweeper; 3 cubic yard capacity; serial #429; rebuilt.

Austin-Western Street Sweeper Model 40, serial #S-136; 2 yard capacity; excellent condition.

Koehring ¾ yard shovel attachment; never used.

International Harvester Model TD14 Bulldozer, serial #31546; new track rails; good condition.

105 Davey Air Compressor; PTO driven, mounted on Ford Truck with utility body; good operating condition.

NORTH JERSEY EQUIPMENT CO.
450 U. S. Highway #1
Newark 5, New Jersey
Bigelow 2-2323

FOR SALE OR RENT

30 ton Browning Diesel Loco. Crane. 1947.
80 ton Porter Diesel Elec. Loco.
35 ton Plymouth Diesel Locomotive.
25 ton Davenport Gas-Elec. Loco.
30 ton Wiley Stiffleg Derrick 80′ Bm.
Lidgerwood 2D Hoist & Swinger, 90 HP Buda Diesel Engine.
30 ton American #2 Guy Derrick. 90′ Bm.
1½ yd. Lima 602 Diesel Crane.
¾ yd. Lima #34 Diesel Crane. 90′ Bm.
60 ton Manitowoc 3900 Erection Crane. Rent.
100 HP Lucey Portable Boilers. 200# WP.

WHISLER EQUIPMENT COMPANY
Affiliated With
MISSISSIPPI VALLEY EQUIPMENT CO.
1905 Railway Exchange St. Louis 1, Mo.

MOBILE TRENCHING MACHINES

Ditching 6″ to 16″ wide to depths of 4′ on many occasions can be accomplished at lower than usual costs. Our Go-For-Digger, which digs off to one side, is as mobile as a pick-up truck. We generally have good rebuilt Jeep-A-Trench machines.

BARBER GREEN 705 RUN A BOUT
Excellent condition $3500.00

JEEP-A-TRENCH ATTACHMENT with new chain cutters installed on your jeep as low as $1850.00.

Write—A. J. PARSONS, Box 11,
Washington, Pennsylvania
Phone—BAldwin 5-0350

CRANES FOR RENT

CRAWLERS Capacities to 60 tons Booms to 180 ft.
TRUCK CRANES Capacities to 35 tons Booms to 130 ft.

P and H. Lima and Manitowoc.
Top-Condition erection cranes

ROGER SHERMAN
CRANE SERVICE, INC.
East Hartford, Connecticut JAckson 8-4106

Heavy Duty Electric
POWER CABLE
Tremendous Inventory
Low, low Prices — CALL COLLECT!
COLEMAN CABLE & WIRE COMPANY
Dept. AC Schiller Pk. Ill. NAtional 5-6215

FOR SALE
MANITOWOC LIFTCRANE
MODEL 3000B
FORSYTHE EQUIPMENT CO., INC.
37-11 Vernon Blvd.
Long Island City 1, N. Y.

FORSYTHE EQUIPMENT CO., INC.

MANITOWOC SPEEDCRANES

RENTALS

Capacities to 70 Tons
Booms to 140 ft. and 30 ft. jibs
Special rates on long rentals

Exeter 2-6125 37-11 Vernon Blvd.
Long Island City 1, New York

FOR SALE

DIESEL ELECTRIC LOCOMOTIVES

STANDARD GAUGE

25 - 35 - 40 - 50 - 65 - 75 - 100 tons

Write for Details

FRANK M. JUDGE & CO., INC.
7010 Empire State Building
New York 1, N. Y.

EIMCO TRACTOR LOADER

One (1) Model 105 Eimco Tractor Loader, equipped with Cummins Diesel Engine, Allison Torque Converter and all standard equipment and accessories

Serial No. 1050197
Engine Serial No. 139265

WALSH, PERINI, MORRISON, KIEWIT, UTAH CO'S
P. O. Box 106, Massena, N. Y.
Phone: Rockwell 9-2456

PILING

SURPLUS NEW and USED — For Sale, Wanted or Rent

NEW AND REBUILT
STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Ton — 18" to 56" Track Gauge
GREENSBURG MACHINE CO.
Greensburg, Pennsylvania

We do a Nation-Wide business in

STEEL SHEET PILING

IMMEDIATE SHIPMENT

380 pcs. 60 ft Beth. DP-2—New York
292 pcs. 60 to 30 ft. Carn. M-116—Illinois
369 pcs. 60 to 50 ft. Beth.—ZP-32—Maryland
490 pcs. 42 ft. Carn. M-116—Louisiana
244 pcs. 35 ft. Carn. M116—Wisconsin
290 pcs. 35 to 15 ft. Beth. AP-3—Ohio
190 pcs. 25 ft. Beth. DP-2—Massachusetts
Other Lengths & Sections at Various Locations

PILE DRIVING EQUIPMENT

Vulcan and McKiernan-Terry
Steam Pile Hammers and Extractors
Hoists and Boilers

MISSISSIPPI VALLEY EQUIPMENT CO.
Railway Exchange Bldg.
St. Louis 1, Mo. CHestnut 1-4474

H-BEARING PILES

Immediate Shipment From
Regular Warehouse Stocks at
ALL FOSTER WAREHOUSES
Also Portland, Seattle, San Francisco, Buffalo

8" - 10" - 12" - 14"

L.B. FOSTER Co.

PITTSBURGH 30 • NEW YORK 7 • ATLANTA 8
HOUSTON 2 • CHICAGO 4 • LOS ANGELES 5

RAILS-TIES

TRACK ACCESSORIES
NEW and RELAYING

DISMANTLING NOW

At Lake Andes, S. D.

10 MILES 75# RAIL

Practically New, with Angle Bars

TIE PLATES & TURNOUTS

CROSS TIES

22,000—6 x 8 x 8 Creosoted Pine

Buy now while dismantling and SAVE

W. H. DYER CO. INC.
2110-X Railway Exchange Bldg., St. Louis 1, Mo.
Phones: GArfield 1-1090 & GArfield 1-4807

STEEL SHEET PILING IN SOUTH
440 pcs. CARNEGIE MP 115—20', 25' & 40'
872 pcs. LARSSEN II 30' & 40' Lengths.
STOCKS NEW ORLEANS, TAMPA, JACKSONVILLE

DIESEL DRAGLINES
1 yd. MARION 43M—55 BOOM NEW 53
¾ yd. LIMA 34—5¾—1 yd. BUCKETS

SEABOARD STEEL CORP.
4521 South Tamiami Trail Sarasota, Florida
Telephone Ringling 7-0461

RENT STEEL SHEET PILING

Get the exact lengths and sections you need of all standard sections, delivered *on time*—and at Foster's usual low rental rates.

H-BEARING PILE
PIPE FOR PILING
LIGHT-WEIGHT STEEL PILING
PILE HAMMERS & EXTRACTORS

L.B. FOSTER Co.

PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

STEEL SHEET PILING

400 PCS. CARNEGIE MZ32—60 FT.
600 PCS. CARNEGIE MP101—60, 65 & 35 FT.
347 PCS. BETH. AP3—25 & 30 FT.
416 PCS. BETH. DP2—31', 37' & 50'
366 PCS. BETH. ZP32—25', 36, & 48'
213 PCS. CARNEGIE MZ27—48 FT.
300 PCS. BP12—53 lb 55' Piles

PILING BOUGHT—SOLD—RENTED

15 x 24 PORTABLE CRUSHER

Model 15 A Diamond Crushing Plant, 15 x 24 Jaw Crusher, 30' x 8' Apron Feeder, Hopper 24" x 26' Conveyor, Gasoline Engine on Pneumatic Tires.

2A CEDAR RAPIDS CRUSHER

24 x 16 Rolls—3' x 8' Screen-on Wheels

R. C. STANHOPE, INC.
60 E. 42nd St. N. Y. 17, N. Y.

RAILROAD Cross and Switch TIES

Promptly from adequate stocks
NEW and USED *(as available)*
GILLIS & COMPANY
134 Breckenridge Lane Louisville 7, Ky.

STEEL SHEET PILING

LARSSEN and ROMBAS Sections

STOCKS AVAILABLE IN:
- Linden, New Jersey
- Ft. Lauderdale, Florida
- Houston, Texas

WESTERN SERVICES CORPORATION
601 E. Linden Ave., Linden, N. J.
MArket 4-4000 HUnter 6-4000

In Florida Call: Port Everglades Steel Co. Ft. Lauderdale—JA. 3-1652
In Houston Call: G. Oliver—CA. 4-7234

STEEL SHEET PILING

AVAILABLE FOR PROMPT SHIPMENT

Pcs.	Section	Length	Location
94	MP-116	34 to 35 ft.	Wisconsin
101	MP-116	15 to 20 ft.	Iowa
75	MP-116	60 ft.	Chicago
110	MP-115	35 to 60 ft.	Kansas City
130	MP-116	35 to 45 ft.	Alabama
36	MP-115	60 ft.	Nebraska
175	MP-116	35 to 60 ft.	Kansas City

CONMACO PHONE DRexel 1-3930
CONTRACTORS MACHINERY COMPANY
804 KANSAS AVE., KANSAS CITY, KANSAS

RAILS—All Sections

NEW RELAYING — All Accessories
TRACK EQUIPMENT, FROGS—CROSSINGS—TIE PLATES, CONTRACTORS AND MINE & MINING MACHINERY CARS

M. K. Frank
Grand Central Palace, New York
401 Park Bldg., Pittsburgh, Pa.
105 Lake Street, Reno, Nevada

RAILS

NEW — RELAYING — TRACK ACCESSORIES
MIDWEST STEEL CORP.
502 DRYDEN STREET
CHARLESTON, W. VA.
IMMEDIATE DELIVERY

FOR SALE OR RENT

CRANES

1—30-ton Browning Locomotive Crane Model M1, D-13000 diesel engine, with 70' boom. Cap. 63,000# @ 12' radius. Excellent condition.

1—Industrial Brownhoist Locomotive Crane, Model L, Steam, with oil-fired boiler. 110' boom, serial #5049. 40-50 ton capacity. Priced for quick sale.

1—Model 820 Lorain, serial #18221, 90' boom, capacity 2 yds. 6-cyl. D-13000 Caterpillar diesel engine. Thoroughly rebuilt.

ROLLERS

1—Tampo Pneumatic-Tired Mdl. R13, with 13 pneumatic tires, size 7.50x15. Rolling width 84". Weight empty 3500#. Weight with ballast 28,000#.

2—Tandem: 1—Austin Western 5-8 ton variable weight, diesel powered, hydraulic steering. Thoroughly rebuilt. 1—Buffalo-Springfield 8-ton, gas, powered, mechanical steering. Good operating condition.

TRENCHERS

2—Buckeye Mdl 12: 1 diesel powered; 1 gasoline powered. Max. digging width 24", depth 5½'. Thoroughly rebuilt.

LOCOMOTIVES

4—8-ton Standard Gauge: 3 Brookville, 1 Plymouth.

2—10-ton Plymouth Standard Gauge Diesel Model BFA.

GENERATOR

1—100 KW Ideal AC, 127/220/230/400/440 volt, 3 ph., 50 or 60 cycle, with Hercules DNX diesel engine, skid mounted. Weight 16,170#.

PILE DRIVING EQUIPMENT

2—#1 Vulcan Hammers with standard base.

5—#2 Vulcan Hammers: 2 with McDermid base; 3 with standard base.

McKiernan-Terry Hammers: 9B3, 9B2, 7, 6, 5, 3 and 1.

Write for Stock List No. 456

EQUIPMENT CORP. OF AMERICA

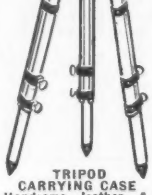
CLIFTON HEIGHTS, PA., Box J608, Sub. of Phila.
GROVETON, PA., Box 43J, Sub. of Pittsb.
CHICAGO 4, ILL., 327J, So. La Salle St.
NEW YORK 7, N. Y., 30J, Church St.

FREE!

A complete list of used construction equipment at each of State's branches. Write Manny D. Croft for free copy at:

STATE Equip. Cos.
3725 N. Front St., Harrisburg Pa.

Plane Table Tripod



(Full size 62 inches)
Mfd. by Dietzen or K&E
Gov't Surplus—Brand New

Johnson leveling arrangement adapts to any size plane table swivels to desired position.

$15.00 Add Postage 75¢

FRACTION OF ORI. COST
REG. $79.00

Ideal for:
- Photographers
- Telescopes
- Surveyors
- Engineers
- Artists

TRIPOD CARRYING CASE
Handsome leather & heavy canvas. Brand new Gov't Cost $15.
NOW $3.50—PP 75c
(Postage free with Tripod order).

Closed 34" . . . Extended 62" . . . Hard wood beautiful polished finish . . . Solid brass fittings
Wt. 9½ Lbs

JOB LOT TRADING CO.
Box 351, Church St. Station New York 8, N. Y.

JUST RELEASED GOVT. SURPLUS

TENSIOMETER

TRADE NAME DYNAMOMETER

Measures Traction, Tension, or Weight

A PRECISION INSTRUMENT WHERE QUICK TESTS FOR SAFETY ARE ESSENTIAL.

Mfg. by Dillon Co.

5" DIAL
8½ LBS

Used by: Leading industrial plants, experimental shops, schools, universities, branches of govt.

To determine strengths of: Bondings ● automobile and aircraft frame and cross piece buckling ● chain and cable ● earth anchors ● draw bar testing hydraulics ● clutch loads ● hardware fixtures ● tractor and truck load pulls.

Simple test arrangements: Simply apply: winch, block and fall, hydraulics, jack, or turnbuckle.

This is NOT a spring measuring device . . . operates by deflection of special ultrasensitive alloy beam. Registers a full scale reading in pounds with only .040 deflection. Certified by U.S. Bureau of Standards. Portable . . . rugged . . . retains sensitivity indefinitely . . . unaffected by temperature. *[FREE Illustrated Brochure on Request.]*

NEW, FULLY GUARANTEED
10,000 LB TEST
$59.00
GOV'T COST $135.00
Complete with case, illustration of construction, and instructions for uses

[Rated firms shipped open account.]

JOB LOT TRADING CO., Box 352, Church St. Station, N. Y. 8, N. Y.

EUCLID SCRAPERS

FOR SALE OR RENT

ONE MODEL 66FDT-17SH TWIN POWERED Cummins diesel engines, 220 H. P. each, 4 wheel tractor drawn 18 cu. yd. scraper. Year 1950. Excellent condition.

ONE MODEL 14TDT-21SH Single Cummins diesel engine, 275 H. P. 4 wheel tractor drawn scraper. Year 1953.

L. B. SMITH, INC.
357 W. Fayette St. Syracuse, N. Y.
Ph. GR 5-2196

FOR IMMEDIATE SHIPMENT
f.o.b. MASSENA, N. Y.

2—10" to 16" H Beam Helmets
3—Sheeting Helmets for SP 6A Pile Section

WALSH, PERINI, MORRISON, KIEWIT, UTAH CO'S
P.O. Box 106, Massena, N. Y.
Phone: ROckwell 9-2456

Complete Shovel Attachment
(less lagging)
For LORAIN 820
23' boom 20' stick
2 cubic yard dipper
Excellent Condition $5000.
at our Brooklyn Branch
Edward Ehrbar Inc., 29 Meserole Ave.
Brooklyn, N. Y. EVergreen 3-5000

BATCHING PLANT: 3 compartment Bin 200 tons capacity, 100 bbl. cement compartment, Bucket Elevator, Cement Screw, 1200 bbl. Cement Bin, 1200 bbl. Cement Bin, complete with motors, etc.
OVERHEAD ELECTRIC TRAVELING CRANES: Two 25 ton, 56' span; one 10 ton and one 20 ton, 56' span; one 6 ton, 79' span; cage control, 230 volt, D. C.
TRUCK CRANES: Lorain T20 complete with crane boom, shovel front and backhoe.
DRAGLINE: P & H model 955, 2½ yd., 90 ft. boom.
BRIDGES: Deck Girder Type—2 Girders each, 44 ft., 54 ft., 65 ft. and 75 ft.
CLAMSHELL BUCKET: Williams 1¼ yd. capacity, excellent condition.
LOCOMOTIVES: 1—G. E. Diesel Electric 25 ton, standard gauge, new 1956. 2—5 ton, standard gauge, with geared Caterpillar power units.
MOTOR: G. E. 50 H. P., 2200 volts, 3 phase, 60 cycle, 450 RPM, with control equipment.
CAR PULLER: Stephens Adamson continuous wire rope Car Puller, 20 H. P., 440 volt, heavy duty type.
BELT CONVEYORS: 60" x 170 ft. and 60" x 300 ft., complete.
MINE HOISTS: Double clutched drums, 10' dia., 10' face, 1⅜" rope, 1000 FPM, one 600 H. P., one 1250 H. P., with all electrics, 2200 volt, 3 phase, 60 cycle.
JAW CRUSHERS: 10 x 15, 10 x 20, 12 x 24, 15 x 36, 18 x 36, 24 x 36, 25 x 40, 30 x 42, 40 x 42, 42 x 48.
GYRATORY & REDUCTION CRUSHERS: All sizes.
WE BUY AND SELL EQUIPMENT THROUGHOUT NORTH AND CENTRAL AMERICA

A. J. O'NEILL
Lansdowne, Pa.
Phila. Phones: MAdison 3-8300 — 3-8301

AIR COMPRESSORS FOR SALE

1—1100 CFM Ingersoll Rand type XCB, size 18" x 11" x 14" flat belt driven by 200 HP 700 RPM General Electric Induction Motor 3/60/2200 volts $12,500.00

1—2400 CFM Ingersoll Rand type PRE2, size 26" & 15½" x 18" powered by 400 HP 200 RPM General Electric Synchronous Motor 3/60/2300-4160 volts $22,500.00

1—3000 CFM Ingersoll Rand type PRE2, size 30" x 18" x 21" powered by 500 HP 180 RPM General Electric Synchronous Motor 3/60/23 volts $27,500.00

WRITE FOR LATEST EQUIPMENT FOR SALE BULLETIN

GUY F. ATKINSON COMPANY
10 West Orange Avenue South San Francisco, Calif.
Phone: PLaza 6-0300, Ext. 125

PROFESSIONAL SERVICES

NEW ENGLAND

Jackson & Moreland, Inc.
Engineers and Consultants

Design and Supervision of Construction

Reports — Examinations — Appraisals

Machine Design—Technical Publications
Boston New York

Metcalf & Eddy
ENGINEERS

Investigations Reports Design
Supervision of Construction
and Operation
Management Valuation Laboratory
1300 Statler Building, Boston 16

MIDDLE ATLANTIC

Fort Lee Construction Co.
Engineers and Constructors

For modern, efficient, design and erection, commercial and industrial, reinforced concrete, structural steel and timber. Complete projects, from inception to completion, based on 25 years continuous successful experience.

Main office 248 Main street, Fort Lee, New Jersey. Telephone Windsor 4-7864.

Edwards, Kelcey & Beck
Consulting Engineers

Reports, Design Supervision
Subways, Expressways, Traffic, Parking
Harbor Works, Bridges, Tunnels
Housing and Industrial Developments
Newark, New Jersey
New York Philadelphia Boston

John Clarkeson
Consulting Engineer

Civil Engineers — Consulting Services

Highways, Airports, Bridges
Surveys, Waterfront Facilities

Albany and Watertown, N. Y.

E. Lionel Pavlo
Consulting Engineer

Design, Supervision, Reports
Bridges, Highways, Expressways
Marine Structures, Public Works
Industrial Construction, Airports
7 E. 47th St. New York 17, N. Y.

D. B. Steinman
Consulting Engineer

BRIDGES
HIGHWAYS
Design, Construction
Strengthening, Investigations,
Reports, Advisory Service

117 Liberty St., New York 6, N. Y.

Severud-Elstad-Krueger
Consulting Engineers

Structural Design - Supervision
Reports - Buildings - Airports
Special Structures

415 Lexington Avenue
New York 17, N. Y.

Lockwood, Kessler & Bartlett, Inc.
Engineers *Surveyors*

Civil Engineering Investigations, Reports and Designs, Supervision of Construction, Cadastral, Geodetic, Topographic & Engineering Surveys, Photogrammetric Engineering and Mapping.
One Aerial Way Syosset, N. Y.

Kain and Hooven
Consulting Engineers

Civil—Structural—Industrial

Registered—Pennsylvania, Delaware, New Jersey

44 S. Lansdowne Ave., Lansdowne, Pa.

Robert W. Lowry, Inc.
Consulting Engineers

Robert W. Lowry M. Lepkaluk
Design, Supervision, Reports, Long Span & Movable Bridges, Expressways, Highways, Airports, Prestress Design, Stress Analysis & Strengthening
227 Pine Street, Harrisburg, Pa.
122 E. 42nd Street, N. Y., N. Y.

Michael Baker, Jr., Inc.

Consulting Engineers, Civil Engineers, Planners & Surveyors; Airports & Highway Design; Water Works & Sewerage Design & Operation; Aerial Topo Maps; Surveys; Reports & Investigations; Irrigation. Home Off.—Rochester, Pa. Br. Off.: Jackson, Miss.; Harrisburg, Pa.; College Park, Md.

Buchart Engineering Corp.
Engineers

Highways — Bridges — Toll Roads
Sewerage — Industrial Waste and Disposal — Water Works — Surveys — Reports — Design — Supervision — Consultation — Industrial — Municipal — Structures

611 W. Market St., York, Pennsylvania

Sprague & Henwood, Inc.
Drilling Services

Foundation Investigations, Soil Testing & Test Borings, Grout Hole Drilling & Pressure Grouting, Diamond Core Drilling

Main Office
221 W. Olive Street, Scranton, Pa.

Branches:
1009 Western Savings Fund Bldg., Philadelphia, Pa.
11 W. 42nd St., New York, New York
200 Magee Bldg., Pittsburgh, Pa.
1248 Church St., Decatur, Ga.
Box 645—Grand Junction, Colorado
Buchans, Newfoundland

SOUTH

Harry Hendon and Associates
ENGINEERS
(Formerly Polk, Powell and Hendon)

Harry H. Hendon L. E. Hoffmann
A. B. Jowers
Civil Engineers—Public Utilities
10 Office Park Circle, Mountain Brook
Birmingham 9, Alabama

Duval Engineering & Contracting Co.
General Contractors

FOUNDATION BORINGS
For Engineers and Architects.
Jacksonville Florida

Rader and Associates
Engineers - Architects

Sewage Disposal, Water Works, Ports, Airports, Bridges, Highways, Office and Commercial Buildings, Industrial Plants, Reports, Investigations, Consultations.

111 N.E. 2nd Avenue, Miami 32, Fla.

MIDDLE WEST

Consoer, Townsend & Associates

Water Supply, Sewerage, Flood Control & Drainage, Bridges, Express Highways, Paving, Power Plants, Appraisals, Reports, Traffic Studies, Airports, Gas & Electric Transmission Lines.
360 East Grand Ave., Chicago 11, Ill.

Mobile Drilling & Engineering Inc.
Foundation Engineering & Testing Division—Contract Drilling Division

Foundation Investigation, Analysis & Design—Earth Dam & Embankment Design—Pavement Design—Compaction Control—Soil Sampling & Testing—Core Drilling.
960 N. Penn. Ave., Indianapolis 4, Ind.

Toledo Testing Laboratory
Engineers—Chemists

Concrete — Soils — Asphalt
Inspection Research
Tests Development
Foundation Investigation
Borings — Diamond Drilling
Load Tests
Soils Mechanics Laboratory

1810 North 12th St. Toledo 2, Ohio

GEOLOGISTS

Geologic Associates
ENGINEERING GEOLOGISTS

Studies and Reports
Foundation Investigations
Specialized Drilling and Sampling

1508 8th Ave. So — Nashville, Tenn
8-1519 Phones 5-4402

INSPECTION & TEST

A. W. Williams Inspection Co.

Established 1921—Member A.C.I.L.
Inspection — Testing — Analyses — Supervision. Foundation Investigations, Soil Borings, Soil Mechanics, Concrete and Asphalt Design and Control, Radiography, Sampling, Calibrations, Timber and timber treatment inspections. Complete testing laboratory service.
Main Office: 308 Virginia St., Mobile, Ala.

Richardson X-Ray Service
a corporation

Field X-ray, Gamma ray Inspection of Penstocks, Pipelines and related welded structures.

World Wide Service

617 S. Raymond Ave. Alhambra, Calif.
Cu 3-1167

The Haller Testing Laboratories, Inc.

140 Cedar St., N. Y. 6, N. Y.

Testing and Inspection of Construction Materials for:
Expressways—Airports
Structures—Bridges

Complete Soils Laboratory

Test Borings—Load Tests

New York, N. Y. Boston, Mass.
Plainfield, N. J. New Haven, Conn.

SEARCHLIGHT SECTION

(Continued from page 129)

SURVEYING INSTRUMENTS
USED • REBUILT • SALE • RENT • REPAIRING

TRANSITS AND LEVELS

New or Rebuilt
Sale or Rent

Headquarters for REPAIRS — any make — Factory Service. We will also buy your old instruments or take them in trade.

A complete line of Engineering Instruments and equipment for field or office. Write for Catalog NRL 75.

WARREN-KNIGHT CO.
Manufacturers of Transits and Levels
136 No. 12th St., Philadelphia 7, Penna.

RE-BUILT REPAIRS RENT REAL EXPERTS

ALL MAKES

BUFF

69 Day St., New York WOrth 2-2797

SPECIALIZED REBUILDING

of surveying and engineering instruments.
All makes and models expertly repaired in modern shop. All work guaranteed.

Distributors for Brunson Instruments
Hickerson Instrument Co.
8 North Edmondson Avenue, Indianapolis 19, Indiana

FOR SALE

NEW STEEL "H" PILES IN STOCK

New York Area
Approx.—60 Ton 12"—53 #—35' to 60'—38' average
Approx.—165 Ton 14"—73 #—50' to 60'—58' average
Ample Storage Space
Loaded on Cars or Trucks

FS-5196, Engineering News-Record, Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

FOR SALE
Motor Grader, Heavy Duty, Hercules Diesel Motor. Hydraulic Controls. Price $2,800.
Will demonstrate at our Yard, CLINTON, MARYLAND.
Phone CYpress 7-8888 weekdays

ADVERTISERS IN THIS ISSUE

Allis-Chalmers Mfg. Co. (Tractor Div.) ... 65
American Vitrified Prod. Co. 5
Arkwright Finishing Co. 70
Armco Drainage & Metal Prod. 63
Atlas Powder Co. 71

Barco Mfg. Co. 97
Belmont Iron Works 78
Bethlehem Steel Co. 81
Byers Co., A. M. .....2nd Cover

Caterpillar Tractor Co. 6, 7
Chase Brass & Copper Co., Inc. 115
Chicago Pneumatic Tool Co. 105
Cleveland Pneumatic 96

Dudgeon, Inc., Richard 78

Fabricated Prod. Co. 110
Fenestra, Inc. 36, 37
Flexible Road Joint Machine Co. 8, 9

General Electric Co. 66, 67
Goodyear Tire & Rubber Co. 1
Granco Steel Prod. Co. 76
Griffin Wellpoint Corp. 85
Gunite Concrete & Construction Co. 82

Heltzel Steel Form & Iron Co. 94, 95
Homelite Div., Texton American Inc. ...60, 61
Hyatt Bearings Div., G. M. C. 18

Intercontinental Equip. Co. 82
Irving Subway Grating Co. 13

Jackson Vibrators Inc. 103
Jenkins Bros. 16
Jersey Bolt 93
Joy Mfg. Co. 68

Keasbey & Mattison Co. 88

Le Tourneau-Westinghouse Co. 53-56
Lincoln Electric Corp. 41

Mac Whyte Co. 35
Masonite Corp. 79
Master Builders Co. .....3rd Cover
McConnaughay, K. E. 80
McKiernan-Terry Corp. 82
Midwestern Ind., Inc. 108
Moretrench Corp. 11

Naylor Pipe Co. 107
Nelson Stud Welding Div. Gregory Ind., Inc. 83
Noble Co. 86, 87
Northwest Engineering Co. 3

Owens Corning Fiberglas Corp. 14, 15

Page Fence 10
Peerless Pump Div., of Food Machy. Corp. 111
Penn Metal Co., Inc. 116
Pennsylvania Drilling Co. 93
Phoenix Bridge Co. 93
Portland Cement Assn. 100
Presstite Keystone Prod. Engr. Co. 117
Prime Mover Co. 78

Reliance Steel Prod. Co. 44, 45
Revere Copper & Brass Inc. 30, 31
Rilco Laminated Prod., Inc. 92
Roebling's Sons Corp., John A. 84
Ryerson & Sons Inc., Jos. T. 96

Servicised Prod. Co. 12
Signode Steel Stamping 118
Socony Mobil 27
Sonoco Prod. Co. 72, 73
Steelcraft Mfg. Co. 62
Stow Mfg. Co. 52
Symons Clamp & Mfg. Co. 2

Tapecoat Co. 34
Texas Co. .....4th Cover
Timber Structures Inc. 57
Timken Roller Bearing Co. 4
Truscon Laboratories 131
Tube Turns Inc. 49, 50

Umeco Optical Div. 96
Union Wire Rope Corp. 74, 75
U. S. Rubber Co. 20
Universal Form Clamp Co. 77

Viber Co. 64

Weil Pump Co. 40
Williams Equipment & Supply Co. 93
Wood Co., R. D. 98, 99

Youngstown Sheet & Tube Co. 91

Professional Services 130

CLASSIFIED ADVERTISING

F. J. Eberle, Business Mgr.

Employment Opportunities 122-126
Educational 126
Notices
Proposal 120-122
Equipment
(Used or Surplus New)
For Rent, Sales Wanted.....126-130

ENGINEERING NEWS-RECORD

330 West 42 St., New York 36—LOngacre 4-3000

ABP Member

Number of copies of this issue printed 77,689

D. S. ROBERTSON, Advertising Manager
D. J. CASSIDY, Business Manager

ADVERTISING REPRESENTATIVES

New York 2—500 5th Ave.
C. D. Neulen, H. T. Olsen
J. C. White

Chicago, 11—520 No. Michigan Ave.,
L. H. Hunt, W. G. Payne
J. A. Shipley

San Francisco, 4—68 Post St.,
J. W. Otterson, R. C. Alcorn

Philadelphia, 3—17th and Sansome Sts.,
D. G. Jensen, D. L. Kates

Cleveland, 15—Hanna Bldg.,
F. P. DiToro, E. B. Mingle Jr.

Detroit, 28—Penobscot Bldg.,
J. A. Houghton

St. Louis, 8—Continental Bldg.,
B. F. Horn

Los Angeles, 17—1125 W. Sixth St.,
H. L. Keeler

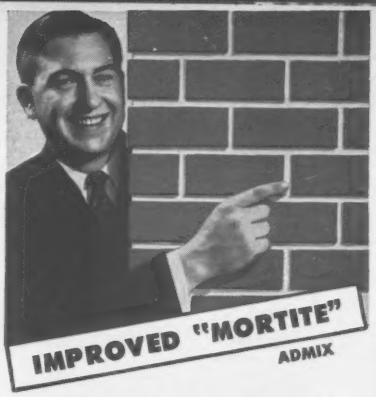
Atlanta, 3—Rhodes-Haverty Bldg.,
D. C. Billian

Dallas, 1—Vaughn Bldg., 1712 Commerce St.,
E. E. Schirmer

Pittsburgh, 22—1111 Oliver Bldg.
M. Russell

OTHER SALES OFFICES:

Boston, 16—350 Park Square Bldg.,
London, McGraw-Hill House



MAKES BETTER— MORE WORKABLE MORTAR!

Get snug, tight, neat joints!

Use MORTITE in *any* mortar, *anywhere*, under *any* conditions. It produces a smooth "buttery" mix with a minimum of water.

Dry mortars are frequently too stiff to be workable. Poor compactness and poor adhesion can result. Truscon MORTITE improves the workability without the addition of detrimental excessive mixing water!

Truscon MORTITE provides greater plasticity which allows time for smooth positive trowelling and "striking-off" of the joints. Less time and effort and lower costs result.

Specify and use MORTITE for better mortar at lower initial cost and long range savings in repointing costs!

Send coupon below to Truscon Laboratories. Learn how MORTITE has produced results for leading engineers and contractors on major projects all over America and the world.

TRUSCON Laboratories
Industrial Maintenance Division of Devoe & Raynolds Co., Inc.

TRUSCON LABORATORIES
1700 Caniff, Dept. E-46, Detroit 11, Mich

SEND FULL INFORMATION

Name_____
Firm_____
Address_____
City_____ Zone____ State____

People and Traffic

IT DAILY BECOMES CLEARER that the problems incident to growth in the metropolitan areas of the United States are destined during the next decade to dominate the activities of the civil engineering profession and of all of its branches of planning, design and construction. Two reports issued in New York last week are, therefore, of wide significance.

Based on capably conducted studies, one, by the Regional Plan Association, focuses on the pattern of population increase in the New York suburbs, the other, by the bi-state Metropolitan Rapid Transit Commission working with the Port of New York Authority, on a proposed rail loop to tie some of these suburbs to the central city. Independently conducted, the studies, nevertheless, are closely related since one treats the cause—more people, more widely dispersed—the other one of the effects—need for an efficient traffic system.

The Rapid Transit report is especially welcome since it brings forward for serious discussion the sadly neglected case of the railway's place in solving the mass transportation problem. And in this discussion a number of widely held theories should be challenged relentlessly. One is that more and better express highways will alone solve the problem. In addition to the congestion on the roads themselves, parking facilities for the cars which will use them are out of the question in the central city. Another theory, which must be abandoned, is that rail commuter traffic can pay its own way without subsidy. The New York study shows that, at least with the fare proposed, the rail loop into nearby New Jersey would run a $12 million annual deficit.

If these two theories about mass transportation solutions can be laid to rest, there is a good chance that progress can be made. If they can't, and the possibilities of rail transport continue to be ignored, the population increase predicted in the Regional Plan report will present New York City with an almost unsolvable traffic emergency.

Summer Jobs for Students

IT IS COMMON ENOUGH that almost the first words a young job-seeker hears are comment on his lack of experience, and advice that he should first get some of that experience, then come back for a job.

And the job-seeker's plaint is just as common—and just as old: How to get experience, if no one will hire him without it?

The construction industry, constantly seeking help to carry out the highway program and many other needed works, is in an excellent position to remedy that complaint—and, incidentally, to provide itself with a pool of future employees who do have some useful experience.

According to the Engineering Manpower Commission (ENR May 16, p. 26) there is a relatively large supply of temporary help that will become available within a month: Nearly 75,000 engineering students who have completed two or three years of college; engineering members of college faculty staffs; high school teachers of mathematics and science.

Yet it appears that there is no concerted effort by the construction industry to get these people into the program during the summer months—despite the claimed shortage of manpower. Sadly, a survey indicates that a great majority of these people take summer jobs, but not in construction, simply because the opportunities have not been granted.

Government and state agencies have taken some advantage of this annual flood of partly trained personnel—and so have some few major contracting firms. The Associated General Contractors has urged its members to hire students but there has been no overwhelming response.

Admittedly, there are two sides to the coin. It is difficult to justify the "summer hire" on a dollars-and-cents basis for any specific year of business. Obviously, the students will be returning to the schools at about the time they have learned enough to be really useful. And it is, of course, important that they do so.

But in terms of the long-range good, the advantage of summer employment is immeasurable, both to the industry and to the people employed. Industry will have had a chance to look over the future crop and know its capabilities, the students will have had a chance to "get experience."

Wouldn't this be an opportunity for local contractor and engineering groups to band together, assess their needs and possibilities for employment as a group, and then proceed to recruit on a pool basis?

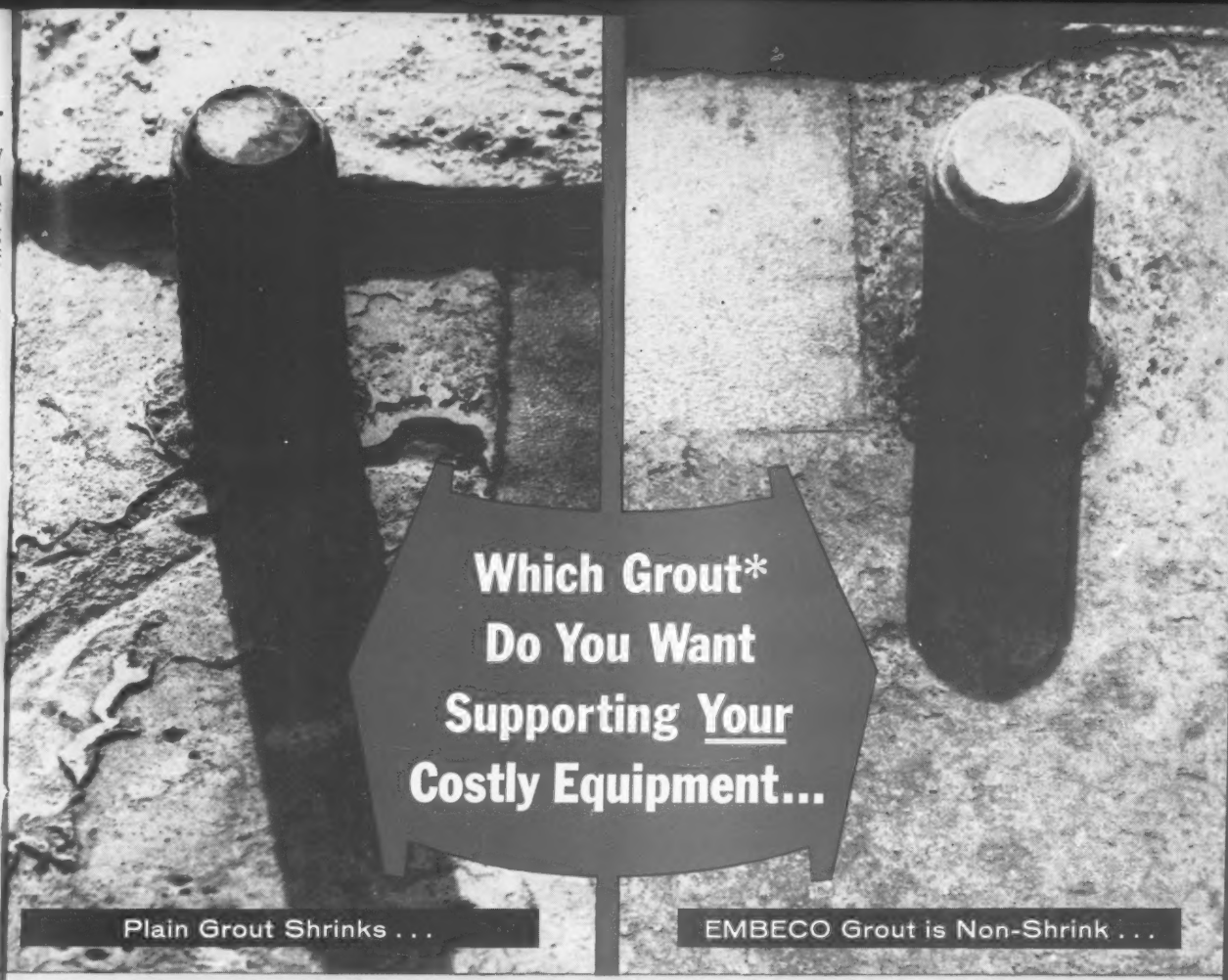
Added Benefit for Beaches

SO CASUALLY AS TO BE UNNOTICED in the conversation between experts discussing their own subject, a seminar on beach and shore protection at Princeton University last week brought out a significant fact:

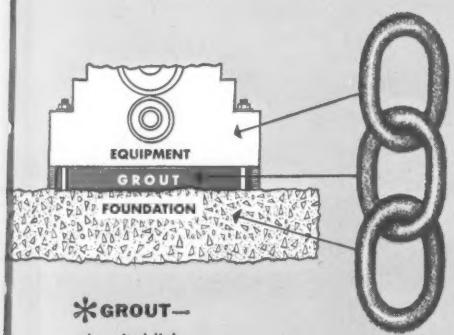
Best and cheapest protection for shore-front areas against the effects of storm or hurricane is a good, firm, broad beach.

That's a fact well known to engineers concerned with protection of shore lines. But it's not well known to the general public or to legislators. Protection of shore front—to most laymen and to many engineers—means seawalls, jetties, groins.

The value of the beach as a protective work itself—providing an area where the energy in the water can expend itself—should be strongly stressed in any arguments for continuing work on protecting U. S. shorelines and properties.



. . . to withstand: **IMPACT • POUNDING ACTION • VIBRATION • SIDE THRUST • TORQUE**



***GROUT—** the vital link between equipment and foundation

LEFT PHOTO . . . ***Plain Grout*** **shrinks and leaves only a web of mortar and a small shim area to support bedplate . . . results in a** ***short-life*** **grout which causes costly shutdowns, possible equipment damage, and loss of production.**

RIGHT PHOTO—*Embeco Non-Shrink Grout* . . . provides full bedplate support, maintains alignment and has high impact resistance . . . is a long-life grout that avoids trouble and cost of untimely re-grouting.

Full information on Embeco Pre-Mixed Grout and "Grouting Specifications"—a valuable guide on machinery and equipment grouting—on request.

THE MASTER BUILDERS CO.

Division of American-Marietta Company

Cleveland 3, Ohio—Toronto 9, Ontario

Cable Address, Mastmethod, N. Y.

11,000-car parking area is paved with Asphalt

ROOSEVELT FIELD SHOPPING CENTER

Garden City, L. I., N. Y.

Largest shopping cen in U.S.

a WEBB & KNAPP project

Emulsified Texaco Asphalt and gravel are mixed by single-pass stabilizer.

Asphalt-coated gravel is spread to desired depth and compacted.

Applying seal coat of Texaco Rapid-curing Cutback Asphalt.

Roller imbeds stone chip in Cutback Asphalt seal c

ASPHALT CONTRACTORS
Frank Marmorale
The Lansdell Company
Standard Bitulithic Co.

CONSULTING ENGINEERS (Paving)
Moran, Proctor, Muesser & Rutledge

ENGINEERING · RESEARCH · EDUCATION · THE ASPHALT INSTITUTE

MEMBER

Roosevelt Field Shopping Center, with its million square feet of retail space, is the nation's largest development of its kind. An essential feature of such a center, if it is to attract and bring customers back in sufficient volume, is an adequate parking area.

Roosevelt Field has parking facilities for 11,000 automobiles. Texaco Asphalt products were used not only to construct a durable pavement at moderate cost on this area, but also in the asphalt curb, which subdivides the parking space.

Emulsified Texaco Asphalt, with gravel available on the site, were mixed thoroughly by a single-pass stabilizer, spread over the parking area by power grader, then rolled to a compacted thickness two inches. This was followed by a se coat of Texaco Rapid-curing Cutback A phalt, covered with stone chips.

The 36,000 linear feet of Texaco Asph curb was laid on the asphalt pavement b a special machine, then painted white f greater visibility.

There is a type of Texaco Asphalt co struction for every paving need, wheth the project is the country's largest shoppi center, an expressway by-passing a lar city, or a farm-to-market road. Helpf information on all of these types of co struction is supplied in two booklets, whic can be obtained without obligation b writing our nearest office.

THE TEXAS COMPANY, Asphalt Sales Div., 135 E. 42nd Street, New York City 17
Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Minneapolis 3 Philadelphia 2 Richmond 19

TEXACO Reg. T. M.

TEXACO ASPHALT